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ABSTRACT

Programs and services that prevent substance abuse and mental health disorders have the potential to lessen an enormous burden of suffering and to reduce both the cost of future treatment and lost productivity at work and home. The availability and accessibility of these interventions to Americans whose health care is provided by managed care organizations depend upon the services' status as covered benefits. The ability to encourage managed care organizations to provide them may be enhanced with evidence of their effectiveness and their positive impact on cost. To compile and disseminate that evidence, this review of the literature presents information on preventive interventions to promote mental health and prevent substance abuse. After an extensive search of peer-reviewed journals, 54 articles from 1964 to 1999 that demonstrate positive outcomes from preventive substance abuse and mental health interventions are summarized in this document. The following six preventive services are recommended for consideration by managed care organizations: (1) prenatal and infancy home visits; (2) targeted cessation education and counseling for smokers, especially those who are pregnant; (3) targeted short-term mental health therapy; (4) self-care education for adults; (5) presurgical educational intervention with adults; (6) and brief counseling and advice to reduce alcohol use. Three appendixes contain preventive behavioral health statistics, past and present; cost analyses; and literature summaries. (Contains 156 references.) (GCP)

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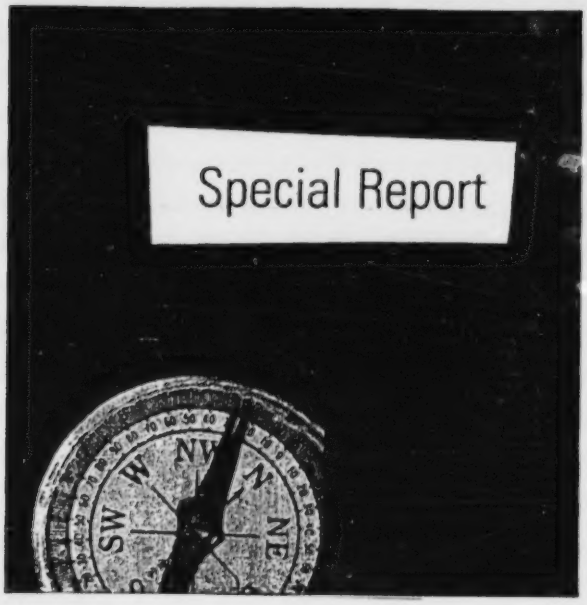

PREVENTIVE INTERVENTIONS *under* MANAGED CARE:

Mental Health and Substance Abuse Services

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PREVENTIVE INTERVENTIONS *under* MANAGED CARE:

Mental Health and Substance Abuse Services

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1. Executive Summary

Programs and services that prevent substance abuse and mental health disorders have the potential to lessen an enormous burden of suffering and to reduce both the cost of future treatment and lost productivity at work and home. The availability and accessibility of these interventions to the millions of Americans whose health care is provided by managed care organizations depend upon the services' status as covered benefits. At a time when cost containment is a driving force in decisions about benefits, the ability to persuade managed care enrollees to demand coverage for these preventive interventions and to encourage managed care organizations to provide them may be enhanced with evidence of their effectiveness and their positive impact on cost.

To compile and disseminate that evidence, the Offices of Managed Care in both the Center for Mental Health Services and the Center for Substance Abuse Prevention, Substance Abuse and Mental Health Services Administration, jointly supported this review of the literature on preventive interventions to promote mental health and the use of tobacco, alcohol, and the misuse of licit and illicit drugs. After an extensive search of peer-reviewed journals, 54 articles from 1964 to 1999 that demonstrate positive outcomes from preventive substance abuse and mental health interventions are summarized in this document. The following six preventive services are recommended for consideration by managed care organizations:

1. Prenatal and infancy home visits.
2. Targeted cessation education and counseling for smokers, especially those who are pregnant.
3. Targeted short-term mental health therapy.
4. Self-care education for adults.
5. Presurgical educational intervention with adults.
6. Brief counseling and advice to reduce alcohol use.

While the documented state of the art is in an early stage of development, intervention research has produced solid evidence that selected preventive programs and services are associated with positive outcomes and that the cost of providing them may be offset by savings elsewhere in the health care system. As efforts to expand this knowledge base move forward, managed care stakeholders can utilize available research results to inform their decisions about coverage for and provision of interventions with the potential to prevent substance abuse and mental health disorders.

Introduction

The prevalence and consequences of substance abuse and mental health problems in the United States create an imperative not only to develop adequate, appropriate, and effective treatments, but also to maximize the potential of preventive approaches. The burden of these problems includes the suffering of the individual and of those in that person's environment, the costs of medical treatment and other related services, and the loss of productivity at work and at home. The stigma often associated with mental health and substance abuse problems imposes an additional burden. Many of these problems are chronic or recurring; are difficult to treat; and require extensive, expensive services that may not be available or sufficient to meet community demands. For all of these reasons, prevention and early identification of mental disorders and substance abuse are vastly preferable to the human and material costs of related illness, treatment, and rehabilitation.

Increasing numbers of Americans depend upon managed care organizations (MCOs) to meet their health care needs. In this era of escalating health care costs, purchasers of health care are under enormous pressure to obtain the highest quality and most comprehensive services at the lowest possible price. Because of their central role in promoting and protecting the health of millions of Americans, MCOs have a particularly strong stake in the substance abuse and mental health arena and a unique opportunity to intervene as early as possible to prevent and control substance abuse and mental health problems in their enrolled populations.

Programs and services to prevent substance abuse and mental health problems should be available through all MCOs because they are a vital component of the health care continuum. When available, documentation of effectiveness and cost savings (or cost neutrality) strengthens the case for incorporating preventive behavioral health care services into MCO contracts. "Where there is a perceived financial incentive," notes one analyst, "prevention has flourished" (Omenn, 1994, p. 7).

However, lingering questions about the effectiveness of preventive interventions and concern about their impact on cost have contributed to reluctance among some MCOs to cover these services. Even if a preventive intervention has been proven effective, MCOs may hesitate to provide coverage if the costs of delivering the service are not greater than or at least neutralized by associated savings. For MCOs, interven-

tions that demonstrate short-term savings in other covered treatment services are of great interest. Some interventions may produce payoffs outside the medical care system (for example, by reducing workplace absenteeism) or over the long term, when the savings may not be realized by the MCO that provided the prevention program or service. As ongoing research provides greater insight into the costs of preventive interventions for substance abuse and mental health problems, it will be important to design and test financial incentives to invest in preventive services for providers that do not derive short-term economic benefit from their adoption.

Therefore, this document responds to two questions commonly asked about these interventions: (1) Are they effective? (2) Can they produce cost savings, or can they be provided without increasing the net cost of care? This literature review addresses concerns about the outcomes and cost of these preventive interventions and helps reduce barriers to coverage for programs and services proven to be effective and economically feasible. The summarized articles provide science-based evidence that interventions designed to prevent substance abuse and mental health problems can contribute to health and well-being; many also demonstrate either cost savings or no negative impact on cost. This evidence may not be widely known among purchasers and consumers.

Persuasive evidence can help managed care executives, health care purchasers, and consumers make informed decisions about the benefits and liabilities of incorporating effective interventions in managed care contracts. The Substance Abuse and Mental Health Services Administration (SAMHSA) is responsible for disseminating knowledge regarding model programs and their outcomes and for publicizing results of state-of-the-art research and evaluation. It is vital that managed care stakeholders learn about research that demonstrates the value of preventive substance abuse and mental health services. That is the primary purpose for which this review has been developed.

III. Behavioral Health Services and Prevention

Programs and services designed to prevent substance abuse and mental health problems, detect potential problems early enough for effective action, or both are often referred to as "preventive behavioral health interventions." In this document, "behavioral" refers to mental health and the abuse of alcohol, tobacco, and both licit and illicit drugs. Some have criticized the term "behavioral health" as too narrow to describe the diverse issues it addresses and the range of prevention and treatment approaches it encompasses. The term is now commonly used in the managed care arena, however, and is recognized within the public health and medical communities as well.

Prevention can take many forms—averting problems altogether; delaying problem onset; identifying a developing problem early enough to make intervention more effective; or decreasing the severity or duration of a problem or both. Within the fields of public and behavioral health, prevention is defined differently. In public health, prevention is generally categorized as *primary* prevention, directed at averting a potential health problem; *secondary* prevention, directed at early detection and, as appropriate, intervention to delay onset or mitigate a health problem; or *tertiary* prevention, directed at minimizing disability and avoiding relapse. In practice, prevention technologies take three general forms in clinical practice: (1) prevention strategies that are usually delivered on a one-to-one basis within the context of traditional medical care; (2) behavioral prevention strategies, sometimes referred to as health promotion, that focus on adopting lifestyles conducive to health; and (3) environmental prevention strategies that are undertaken by a community to safeguard the well-being of all citizens (Teutsch, 1992).

In its 1994 report, *Reducing Risks for Mental Disorders: Frontiers for Prevention Intervention Research*, the Institute of Medicine (IOM) proposed a more restrictive set of definitions related to behavioral health, correlated with levels of health risk in target populations (Mrazek & Haggerty, 1994). These definitions are based upon a classification proposed more than a decade earlier (Gordon, 1983). The "continuum of care" spectrum that encompasses these three categories of prevention is shown in Figure 1.

The three classifications within the IOM Model of Prevention are:

- universal interventions, offered to an entire population because their benefits outweigh their cost and risk;

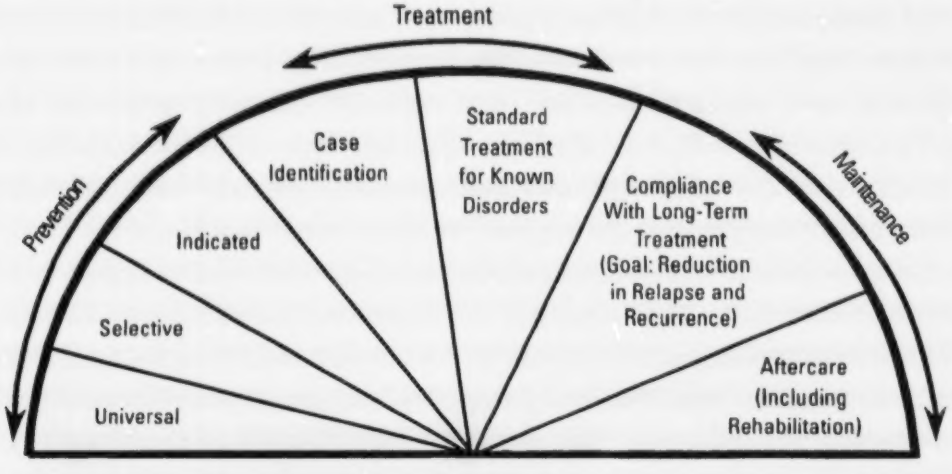
- *selective* interventions, targeted only to groups at greater risk than the rest of the population, incurring a moderate cost justified by the increased risk of illness; and
- *indicated* interventions, provided only to high-risk individuals and to those persons who are experiencing early symptoms of a disorder either to prevent future development of a health problem or to reduce the duration or severity of a health problem.

Post-diagnosis preventive interventions (Mrazek & Haggerty, 1994) as well as mental health promotion (Mrazek, 1998) are excluded from this model. Treatment includes screening and care for existing problems; maintenance encompasses aftercare and rehabilitation. Although the IOM triad has gained considerable acceptance in the behavioral health care field, a later report to the National Advisory Mental Health Council by the National Institute of Mental Health (NIMH) Ad Hoc Committee on Prevention Research utilized a broader definition and scope of prevention research (NIMH, 1998).

Risk factors and protective factors are also central to an understanding of prevention in the mental health and substance abuse arenas. The presence of risk factors is associated with an increased potential to develop a mental health or substance abuse problem. Protective factors reduce the potential to develop these problems. An at-risk individual may benefit from the presence of protective factors. Current research seeks to determine how risk factors that cause problems can be changed through preventive interventions (Mrazek & Haggerty, 1994) as well as to identify, maintain, and strengthen protective factors.

A recent report sponsored by the National Mental Health Association, *Preventing Mental Health and Substance Abuse in Managed Care Settings* (Mrazek, 1998), proposed that preventive behavioral health services in MCOs incorporate the following elements:

Figure 1. Continuum of Health Care



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- healthy development across the lifespan;
- high priority on children and their families;
- assessment and delivery of services based on modifiable risk and protective factors;
- elimination of access barriers to health care and incorporation of aggressive service delivery outreach;
- screening of enrollees for early identification of at-risk populations;
- use of risk profiles to deliver preventive interventions that are operationalized, defined, and evidence-based;
- provision of preventive interventions that include a maintenance component to enrollees at risk for substance abuse;
- tracking of performance measures such as program completion rates, risk reduction, protective factor enhancement, decreased onset of disease and disability, resources invested in preventive services, and cost savings;
- consumer involvement in a partnership with purchasers to determine health policy and service; and
- partnerships and collaboration between health care service providers and related community resources.

From the perspective of the Center for Mental Health Services (CMHS), prevention is

> an attractive alternative to the current system of trying to mend and maintain those who suffer because their needs have not been met. The preventive model also represents a comprehensive and systematic approach for dealing with individuals and their environment in a humane and holistic manner. On the other hand, the preventive model, despite a long history, continues to be plagued by philosophical and intellectual debate as well as political conflict. Furthermore, in the present economic context, the preventive approach also shoulders the additional burden of having to compete for scarce financial resources with the preponderance of its collateral being a tenuous promise to reduce the incidence of future problems....Analysis of costs and benefits can help inform decision makers about which kind of preventive intervention should hold the most promise for yielding benefits.
>
> *(CMHS, 1996c, Foreword)*

This review has sorted through the scientific literature to identify the most cost-effective and productive preventive interventions an insurer might include without incurring a financial loss. The current shift to managed care provides an opportunity for MCOs to consider and provide prevention with the same weighted value as treatment and rehabilitation.

IV. Quality of the Evidence

The *Clinician's Handbook of Preventive Services, 2nd Edition,* U.S. Preventive Services Task Force (1998), contains recommendations regarding clinical preventive services, including some related to mental health and substance abuse. In a rigorous review of the knowledge base, the Task Force categorized the strength of the research based upon the quality of scientific evidence as follows:

I: Evidence obtained from at least one properly designed randomized controlled trial.

II-1: Evidence obtained from well-designed controlled trials without randomization.

II-2: Evidence obtained from well-designed cohort or case-control analytic studies, preferably from more than one center or research group.

II-3: Evidence obtained from multiple time series with or without the intervention, or dramatic results in uncontrolled experiments.

III: Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees.

(U.S. Department of Health and Human Services, 1998)

While the Task Force concluded that evidence was insufficient to support universal screening for behavioral health problems, its report cited indications for targeted screening of at-risk populations (CSAP, 1996).

The extensive review of the state of the knowledge base that underpins the 1994 IOM report, *Reducing Risks for Mental Disorders: Frontiers for Prevention Intervention Research,* also found convincing evidence of prevention effectiveness. According to that report:

> There have now been sufficient advances in knowledge to warrant the prompt mounting of intensive interventions designed to prevent mental disorders, so long as these programs are rigorously evaluated; for other conditions there is still the need for development of an adequate knowledge base before sound theoretically-based interventions are warranted.
>
> *(Mrazek & Haggerty, 1994, p. vi)*

> Mental health reimbursement from existing health insurance should be provided for preventive interventions that have proved effective under rigorous research standards.
>
> *(Mrazek & Haggerty, 1994, p. xiii)*

In its deliberations, the Institute of Medicine's Committee on Quality Assurance and Accreditation Guidelines for Managed Behavioral Health Care used an evidence-based approach. In doing so, the Committee concluded that the research base in behavioral health care is far less advanced than in other areas of health care (Edmunds et al., 1997).

The National Institute on Drug Abuse (NIDA) recently observed that "empirical data gathered through rigorous scientific methods are being demanded by the field so that policy making can be improved by the adoption and implementation of science-based drug abuse prevention programs that actually work in the real world" (NIDA, 1998, p. 1). Some prevention research is insufficiently rigorous to add to the evidence base. Experimental designs (pretest-posttest control group design; posttest-only control group design; delayed treatment design) are the most rigorous. However, the complexities of prevention research sometimes rely on quasi-experimental designs (nonequivalent comparison group, time-series, time-series with comparison group) or nonexperimental designs. NIDA (1998) has noted that methodological flaws are common in prevention program evaluations. Examples of these methodological problems include small samples, participant attrition, and insufficient long-term followup (Heller, 1996).

Among the hindrances to more rapid knowledge advances is the extent to which research efforts are dispersed in this multidisciplinary arena. The 1994 IOM report noted that research related to the prevention of mental health problems emanates from many fields, including neurosciences, genetics, epidemiology, psychiatry, psychology, behavioral sciences (including developmental psychopathology), and risk research (Mrazek & Haggerty, 1994). Research support comes from diverse sources; investigators represent a wide variety of disciplines; and results are disseminated through a vast array of journals and conferences, making it difficult to track and integrate new knowledge. The report called for a national commitment to rigorous research and for cooperation among Federal, State, and local agencies; universities; foundations; researchers; and communities to expand the evidence base.

According to the American College of Mental Health Administration (ACMHA):

> There are empirically validated studies which demonstrate the efficacy, cost-offset and improved outcomes for a variety of mental health and medical problems through psychosocial interventions. It is now possible—and prudent—to incorporate preventive services for behaviorally related problems into general health and mental health and substance abuse systems of care.
>
> *(ACMHA, 1997, p. 27)*

The National Mental Health Association's publication *Preventing Mental Health and Substance Abuse Problems in Managed Health Care Settings* concludes:

> Evidence-based, effective preventive interventions will increasingly be in demand as a realistic tool for managing the need for health care services. As treatment services are curtailed as much as purchasers, consumers, and politicians will tolerate, prevention of initial offset may become more valued, especially as prevention before disorder proves to be more cost effective than treatment after disorder.
>
> *(Mrazek, 1998, p. 21)*

V. Method

Preparation of this literature review involved extensive searches for two kinds of documents. The first set addressed policy, projects, and issues related to prevention in general; the prevention of substance abuse and mental health problems specifically; and the availability of preventive behavioral health services to enrollees of managed care organizations. Information from the review of these documents is included in earlier chapters and in Appendices A and B.

The second set of documents included evaluations of preventive interventions with a link to substance use (alcohol, tobacco, and drugs) or mental health that have been published in peer-reviewed journals, including those addressing the cost impact of the interventions. This component of the search focused on identifying intervention studies that met the following criteria:

- The intervention fit within the definition of primary prevention, secondary prevention or one of the three classifications in the IOM's Model of Prevention (universal, selective, or indicated interventions).
- The study evaluated or reviewed one or more interventions designed to prevent a substance abuse (i.e., alcohol, tobacco, or drug) problem or a mental health problem, or a behavioral health intervention designed to prevent an associated health problem, such as cessation counseling for pregnant smokers to reduce the incidence of low birthweight babies.
- The intervention was implemented with human subjects; or an intervention model was applied to a hypothetical group of human subjects.
- The intervention was implemented in a medical care or referral setting.
- The intervention was shown to result in cost savings, cost offset, or neutral impact on the cost of care; or the intervention was shown to be effective with the potential to result in cost savings, cost offset, or no negative impact on the cost of care.
- The study was published in 1964 through 1999 in the English language and in a peer-reviewed journal.

The majority of the studies obtained for this review were located through Internet Grateful Med V2.3.2, which includes 11 databases: MEDLINE, HealthSTAR, PREMEDLINE, AIDSLINE, AIDSDRUGS, AIDSTRIALS, DIRLINE, HISTLINE, HSRPROJ, OLDMEDLINE, and SDILINE. The following search terms were used: behavior, cost-benefit analysis, cost-effectiveness, cost savings, evaluation studies, health education, health maintenance organizations (HMOs), health promotion, intervention studies, managed care programs, mental health, patient education, prevention, preventive health services, preventive medicine,

primary prevention/economics, and substance abuse.

The search also included SAMHSA's National Clearinghouse for Alcohol and Drug Information, CMHS' National Mental Health Services Knowledge Exchange Network, and the Web site of the Agency for Healthcare Research and Quality. In addition, published articles were recommended for review and bibliographies were provided by staff of the CMHS and CSAP Offices of Managed Care. Additional studies were contributed from the files of the author. Finally, some researchers who made relevant presentations at conferences were contacted by telephone or electronic mail to solicit published articles.

From the numerous titles identified and screened through these search methods, 78 articles were obtained and evaluated. Criteria for inclusion in the literature review were met by 54 of those articles. Appendix C includes detailed summaries of these studies organized by the developmental stage of the research subjects (prenatal/pregnancy, infants, children ages 1 to 12, adolescents ages 13 to 17, families, adults ages 18 to 64, and adults age 65 and over). In each developmental stage, studies that address cost impact are listed separately from those with no cost data. Within those subsections, studies are listed alphabetically by author. Every literature summary is structured identically:

- Reference (number and full citation);
- Study question;
- Description of study population;
- Description of intervention;
- Design;
- Effectiveness of intervention;
- Cost impact of intervention.

Information such as costs incurred in delivering an intervention, the percentage of eligible individuals that participated in an intervention, and the type of personnel involved in service delivery is included if provided in the article cited.

VI. Findings

Of the 54 studies that met the criteria for inclusion in this review, 27 (50%) addressed mental health; 17 (31%) addressed substance use/abuse (drug use, 4; alcohol abuse, 5; tobacco use, 8). The other 10 (19%) addressed the effects of self-care, education, and clinical preventive services on overall well-being and associated medical care utilization. In terms of developmental categories, the majority of studies utilized adult subjects between the ages of 18 and 64 (29 or 54%). Fourteen studies included adolescents between the ages of 13 and 17 (26%); 10 focused on families, 10 had a population encompassing adults age 65 and older, and 10 had children to age 12 as subjects (19%). There were six studies on infants (11%) and five prenatal or pregnancy studies (9% each).

All articles included in this review document positive outcomes of preventive interventions in relation to mental health or substance abuse. Thirteen of the 54 articles (22%) address the cost of the intervention.

Table 1 summarizes the studies included in this review by the developmental stage of research subjects, first author, year of publication, and whether or not the article provides information about the cost impact of the evaluated intervention. The parenthetical number after year of publication corresponds to the numbered summaries in Appendix C. Studies with subjects from more than one developmental stage are included in each relevant category, and thus may be listed more than once.

Overall, these studies represent the body of science-based evidence that interventions designed to prevent substance abuse and mental health problems have been proven effective and, in some cases, have produced net cost savings or have offset costs that would have been incurred absent the preventive intervention. The 54 literature summaries in Appendix C describe the research subjects, interventions, and evaluation designs, and report the study outcomes. The six interventions with the strongest supportive evidence are listed and described in Chapter 7.

Table I: Summary of studies reviewed

Developmental stage of research subjects	*Studies specifying cost impact of intervention*	*Studies not specifying cost impact of intervention*
Prenatal/pregnancy	Marks et al., 1990(1) Olds et al., 1993(2) Windsor et al., 1993(3)	Olds et al., 1997(4) Ramey & Ramey, 1992(5)
Infants	Olds et al., 1993(2)	Field, 1995(6) Field et al., 1996a(7) Field et al., 1982(8) Olds et al., 1997(4) Ramey & Ramey, 1992(5)
Children ages 1–12		Beardslee et al., 1997a(9) Beardslee et al., 1996(10) Beardslee et al., 1997b(11) Durlak, 1998(12) Durlak & Wells, 1998(13) Durlak & Wells, 1997(14) Finney et al., 1991(15) Mullen & Zapka, 1981(16) Ramey & Ramey, 1992(5) Roter et al., 1998 (17)
Adolescents ages 13–17		Beardslee et al., 1997a(9) Beardslee et al., 1996(10) Beardslee et al., 1997b(11) Clarke et al., 1995(18) Durlak, 1998(12) Durlak & Wells, 1998(13) Durlak & Wells, 1997(14) Eakin et al., 1989(19) Field et al., 1996b(20) Field et al., 1982(8) Finney et al., 1991(15) Rosen & Wiens, 1979(21) Roter et al., 1998(17) Tobler, 1992(22)
Families	Olds et al., 1993(2)	Aktan et al., 1996(23) Beardslee et al., 1997a(9) Beardslee et al., 1996(10) Beardslee et al., 1997b(11) Field et al., 1998(24) Field et al., 1982(8) Mullen & Zapka, 1981(16) Olds et al., 1997(4) Ramey & Ramey, 1992(5)
Adults ages 18–64	Altman et al., 1987(25) Cummings et al., 1989(26) Fiscella & Franks, 1996(27) Green et al., 1978(28) Kemper, 1982(29) Pelletier, 1996(30) Smith et al., 1995(31) Vickery et al., 1983(32)	Bien et al., 1993(33) Bottomly, 1997(34) Devine & Cook, 1983(35) Devine et al., 1988(36) Devine & Reifschneider, 1995(37) Egbert et al., 1964(38) Fleming et al., 1997(39) Fries et al., 1992(40) Goldberg et al., 1981(41) Heather et al., 1987(42) Kemper et al., 1993(43) Maccoby et al., 1977(44) Morisky et al., 1983(45) Mullen & Zapka, 1981(16) Mumford et al., 1982(46)

Developmental stage of research subjects	*Studies specifying cost impact of intervention*	*Studies not specifying cost impact of intervention*
		Rippe et al., 1998(47) Rosen & Wiens, 1979(21) Roter et al., 1998(17) Schneider et al., 1995(48) Shipley et al., 1988(49) World Health Organization, 1996(50)
Adults ages 65+	Leigh et al., 1992(51) Pelletier, 1996(30) Vickery et al., 1988(52)	Devine et al., 1988(36) Fleming et al., 1999(53) Fries et al., 1992(40) German et al., 1995(54) Kemper et al., 1993(43) Roter et al., 1998(17) Schneider et al., 1995(48)

VII. Conclusions

This literature review presents the research foundation that provides an affirmative answer to the two questions posed in Chapter 1: (1) Are preventive behavioral health interventions effective? (2) Can they produce cost savings, or can they be provided without increasing the net cost of care?

While the establishment and continuing expansion of this knowledge base is encouraging, the substance abuse and mental health arena is vast, the focus on prevention is relatively new, and funding for prevention intervention research is insufficient to produce the quality and quantity of data needed to make an irrefutable case for effectiveness and cost offset. Less than one-quarter of the articles that met the criteria for inclusion in this review specified the cost impact of the target intervention. Many more studies focused on adult subjects than on infants and children. At this time, the available literature more resembles a collection of independent studies than a cohesive, developing body of work.

Because the search for this literature was extensive but not exhaustive, some studies meeting review criteria may not have been identified. The search did not identify research not yet published as of the date this report was written. In addition, there is research on school-based preventive interventions that lies outside the scope of this review. While schools are an obvious and important setting for preventive intervention in substance abuse and mental health, health care providers in general and managed care organizations in particular still have vital roles to play in this regard for the youth to whom they provide services.

The dispersion of the literature on preventive behavioral health services has complicated the process of its identification. Although investigators in the fields of mental health, drug and alcohol abuse, and tobacco use traditionally have worked within separate, poorly integrated domains, increased interdisciplinary communication and collaboration have advanced research in these areas. While this research has been enriched by its multidisciplinary nature, published articles are scattered among journals in the public health, medical, mental health, substance abuse, and developmental fields. Locating relevant literature requires the search of many databases and an understanding of their lexicons, because they may use different keywords to describe similar content.

When intervention research yields positive findings, those results are strengthened by subsequent replication studies and, where appropriate, adaptation of the intervention to other populations and settings. For this to happen, investigators must be interested in pursuing the research question, and must have resources to support further study. Unless followup studies are undertaken and

published by the author of the original research, it is difficult to determine whether replication has occurred and whether results were confirmed. In addition, replication studies that do not reproduce initial findings may not be published at all, in which case there would be nothing in the peer-reviewed literature to refute original results.

The published literature does not necessarily provide specific data that can inform MCO decision makers about implementation, effectiveness, and cost of preventive behavioral health services in their settings. To be publishable, articles must conform to the requirements of peer-reviewed journals. The result is that the subjects and settings of published research may not be generalizable to MCO populations; the interventions may not be described in sufficient detail to determine appropriate targeting and staffing, likely penetration and other important considerations; and the findings may not translate well to the kinds of outcomes in which MCOs are interested. The application of this research to practice in MCOs will require improved communication and greater collaboration among researchers, decision makers, planners, providers, and evaluators.

One way to address the latter gap would be to provide estimates of the cost to an MCO to cover selected preventive behavioral health services. Using a prospective modeling computer simulation technique, intervention costs can be projected, including aggregate costs to the MCO; cost per user of the intervention; and cost per member per month for various MCO sizes, enrollment mixes, and contractual arrangements. CMHS is currently producing such estimations for the six services recommended in this report.

A foundation of empirical evidence supporting the value of preventive behavioral health interventions has been established and is growing, but many questions about their effectiveness and effect on cost are yet to be answered. Additional steps that can be taken to strengthen this knowledge base and to generate more persuasive data on preventive behavioral health interventions to stimulate increased MCO coverage are as follows:

- Expand funding for research on the efficacy, effectiveness, and cost impact of preventive behavioral health interventions, especially in health care settings.
- Encourage investigators to undertake relevant research in managed care organizations.
- Fund graduate and postgraduate research in this arena to increase the number of new investigators who pursue substance abuse and mental health prevention research as a primary career focus.
- Require analysis of cost impact as a condition of intervention research funding.
- Encourage MCOs to partner with SAMHSA and with universities to conduct intervention research projects within their populations.
- Where possible, work with researchers whose publications do not contain cost information to generate cost projections based on unpublished data.

VIII. Services Recommended for Consideration by Managed Care Organizations

The articles reviewed for this document describe a wide range of preventive behavioral health interventions, research subjects, evaluation designs, and outcomes. While the evidence of positive outcomes in all of these articles merits the attention of MCO stakeholders, six interventions are recommended for MCO consideration because:

- their effectiveness has been demonstrated by two or more studies included in this review,
- their appropriateness for provision in a managed care or referral setting has been explicitly stated or is apparent; and
- their feasibility for MCO coverage from a cost perspective has been documented or suggested.

The fact that some of the services described in reviewed studies are not included on this list does not imply that they should not receive MCO consideration; rather, it means that additional information is needed about the effectiveness of those programs and services in relation to desired managed care outcomes and cost impact.

The citations abbreviated parenthetically after each listed service refer to the supportive articles included in this review. The interventions in the cited articles are similar but not identical; their adoption by an MCO should be tailored to the characteristics of its providers and members. Detailed summaries of these articles are provided in Appendix C.

1. **Prenatal and infancy home visits** (Field et al., 1982 [reference 8]; Olds et al., 1993 [reference 2]; Ramey & Ramey, 1992 [reference 5]). These articles focused on women with high-risk pregnancies, teenage mothers, and low-birthweight infants born prematurely. The timing of periodic home visits varied, ranging from the prenatal period until the child reached 3 years of age. Home visits were made by nurses in one project and by a psychology graduate student teamed with a Comprehensive Education Training Act (CETA) aide in another. The content of the home visits in one study focused on maternal

functioning and in others on the training of mothers to stimulate their infants. Significant findings included fewer subsequent pregnancies and live births, greater spacing between births, less alcohol and drug impairment, and less child abuse and neglect among mothers receiving home visits; greater weight and better scores on motor developmental tests among infants whose mothers received intervention; and reduced incidence of mental retardation among infants whose mothers received intervention.

2. **Targeted cessation education, and counseling for smokers, especially those who are pregnant** (Cummings et al., 1989 [reference 26]; Marks et al., 1990 [reference 1]; Windsor et al., 1993 [reference 3]). Subjects in these articles included a birth cohort of women who smoked during pregnancy, pregnant smokers recruited through county maternity clinics, and a hypothetical group of male and female smokers receiving routine medical care. Interventions consisted of a 15-minute counseling session with a nurse or health educator, supplemented by written materials and two followup telephone calls; a 15-minute counseling and skill development session with a trained health counselor, supplemented by clinical patient reinforcement, social support, newsletter information, and mention in a prenatal education class; and 4 minutes of physician advice to quit smoking, supplemented by a self-help booklet and a 1-year followup visit. The birth cohort model study estimated savings of $3.31 of the cost of caring for low-birthweight infants in a neonatal intensive care unit for every dollar spent on smoking cessation intervention. In the hypothetical patient group, brief physician advice was estimated to increase the cessation rate at 1 year by 2.7%. In the maternity clinics, the intervention produced a 14.3% quit rate compared with an 8.5% quit rate in the control group.
3. **Targeted short-term mental health therapy** (Finney et al., 1991 [reference 15]; Goldberg et al., 1981 [reference 41]). In a study of children up to the age of 15 who received one to six targeted behavioral therapy sessions with their parents from doctoral-level pediatric psychologists or predoctoral clinical psychology interns, those with behavioral problems reduced their medical encounters by almost a third, while those with toileting problems reduced their medical encounters by almost one-half. In another group of individuals who sought short-term psychotherapy from a psychiatrist or other registered psychotherapist on an approved list of community practitioners, index cases decreased days of medical hospitalization significantly compared with matched controls.
4. **Self-care education for adults** (Fries et al., 1992 [reference 40]; Kemper, 1982 [reference 29]; Kemper et al., 1993 [reference 43]; Leigh et al., 1992 [reference 51]; Vickery et al., 1983 [reference 32]; Vickery et al., 1988 [reference 52]). Five of the six cited studies were conducted in managed care settings; the sixth was worksite based. The interventions addressed health promotion and self-care issues that encompassed substance use and mental health. Interventions included group education workshops led by a nurse practitioner, supplemented by a self-care guide and videotapes, written materials, a telephone information service staffed by a

nurse coordinator, and an individual health evaluation and planning conference with a trained nurse; computer-based, serial, personal health risk reports supplemented by individualized recommendation letters and written materials; access to a self-care center; one-on-one education sessions with physicians; and slide-tape shows. Results included an estimated 28% savings in laboratory costs and 24% savings in x-ray costs between experimental and control groups; a 17% decrease in total medical visits, and a 35% decrease in minor illness visits in experimental versus control groups. Significant improvements in health risk behaviors were noted, including smoking, alcohol use, and reported stress; decreases in ambulatory physician visits ranging from 7.2% to 24%; and a decrease of 15% in total medical visits in the experimental group compared with controls. In one study, for every dollar expended on the program, an estimated $5 were saved in direct health care costs for physician visits and hospital days.

5. **Presurgical educational intervention with adults** (Devine & Cook, 1983 [reference 35]; Devine et al., 1988 [reference 36]; Egbert et al., 1964 [reference 38]). In one of the cited studies, the intervention consisted of a workshop to enable staff nurses to provide psychoeducational care to adult surgical patients. Interventions described in the other two articles included information for patients about what to expect; skills training to help patients prevent complications or reduce anxiety; psychosocial support with a health care provider to reduce anxiety or enhance ability to cope with hospitalization, supplemented with printed and taped materials; and visits to patients by an anesthetist before and after surgery to provide information and self-care guidance. Interventions were associated with less use of sedatives, antiemetics, hypnotics, and narcotics as well as earlier discharge from the hospital.

6. **Brief counseling and advice to reduce alcohol use** (Bien et al., 1993 [reference 33]; Fleming et al., 1997 [reference 39]; Fleming et al., 1999 [reference 53]; World Health Organization, 1996 [reference 50]). The articles reviewed studies conducted in the United States and internationally. Interventions included between 5 and 15 minutes of advice or counseling on reducing alcohol consumption provided by physicians, nurses, psychologists, or other professionals. In some studies, subjects also received a workbook or informational or self-help materials. Other intervention components included follow-up visits or telephone calls for reinforcement. Significant reductions in alcohol consumption were documented.

IX. Appendix A: Preventive Behavioral Health, Past and Present

How widespread, severe, and costly are mental disorders and substance abuse problems? Consider the following:

- One-third of American adults may develop a diagnosable mental disorder in their lifetimes, and one adult in five is thought to have a mental disorder at any given time (Robins & Regier, 1991).
- An estimated 12% of all children and adolescents in this country have one or more mental disorders (Pelosi, 1996).
- Depression is the fourth leading cause of illness-related disability in the world (NIMH, 1998).
- Of the 10 major causes of disability worldwide, half are mental disorders and substance abuse problems (Mrazek, 1998).
- In 1996, the cost to the nation of providing treatment for mental disorders and the abuse of alcohol and other drugs was $79.3 billion.

An analysis of "actual" causes of death in the United States concluded that in 1990, tobacco was first (400,000, or 19% of deaths); alcohol was third (100,000, or 5% of deaths); and illicit use of drugs was ninth (20,000, or 1% of deaths). The authors pointed out that health resources were being allocated based on conditions that are recorded on death certificates rather than these preventable causes of mortality, estimating the national investment in prevention at less than 5% of total annual health care expenditures (McGinnis & Foege, 1993).

NIMH has traced the prevention of mental disorders to the 1930s, noting that early efforts were based on humanitarian concerns rather than a foundation of research. Starting in the late 1960s, increased emphasis was placed on the importance of creating and building a knowledge base (NIMH, 1998).

Preventive services have been a component of managed care for many years. In 1982, the U.S. Department of Health and Human Services published *Guidelines for Health Promotion and Education Services in HMOs*, which updated a 1976 document entitled *Planning Health Education in*

HMOs. Noted the authors, "HMOs are a special form of health care delivery not only because of the cost savings they achieve but because of the opportunity they offer for provision of preventive and health education services" (Mullen & Zapka, 1982).

Unfortunately, behavioral health services in general have taken a back seat to primary medical care services in managed care contracts; preventive behavioral services benefits are not widely available. In recent years, capitation for behavioral health services has been decreasing, while restrictions on those services have been increasing (Mrazek & Haggerty, 1994). Data from 1997 indicate that at least 75% of employer-sponsored health plans restrict behavioral health coverage more than general medical coverage (Buck, Teich, Umland, & Stein, 1999).

Increasingly, managed care enrollees are receiving behavioral health services from managed behavioral health care organizations (MBHOs), which "carve out" behavioral health care services from other medical care services and deliver them to a defined population. Private-sector employers and public-sector institutions such as Medicaid and State mental health and substance abuse agencies negotiate these arrangements to control costs and to improve quality and access for mental health and substance abuse care (Edmunds et al., 1997). Other models for managed mental health and substance abuse care include the following: *integrated* with other health services within a single managed care company; *left out* of MCO coverage entirely; and *modified integrated* or "partially carved out" so that enrollees receive some acute behavioral services from the physical health plan but receive referrals to a specialty provider when more intensive intervention is indicated (Substance Abuse and Mental Health Services Administration, 1998b).

A recent survey of HMOs by Conwal, Inc., regarding health promotion activities found that managed health care relationships with prevention took many forms: (1) prevention subcontracts from the MCO to community resources; (2) prevention carveouts in which the MCO is required to support a designated specialty prevention provider; (3) community patronage in which prevention is provided as a "philanthropic commitment" (Stoil & Hill, 1998, p. 21); (4) a case referral model in which enrollees are referred to community resources without direct compensation; (5) strategic investment by the MCO as a long-term community or enrollee benefit; (6) a collaborative model in which the MCO and community-based organizations collaborate fully in the prevention arena; and (7) an integrated services model in which the MCO adopts community-based prevention as an integral component (Stoil & Hill, 1998).

Consumers, providers, insurers, and purchasers are all stakeholders in decisions about which services will be included in MCO contracts and how they will be delivered. Other stakeholders include constituency groups, accrediting organizations, government agencies, and business groups on health (Mrazek, 1998). Several compelling reasons motivate these stakeholders to support the incorporation of proven, effective preventive behavioral health programs and services into MCO systems of care:

- It is in the public interest to prevent mental disorders and substance abuse rather than to wait until disease and disability impose their burdens.
- A substantial and growing body of research provides evidence that certain preventive behavioral health interventions are efficacious (that is, they work under ideal conditions) and effective (that is, they work under "real world" circumstances).
- A small but developing body of multidisciplinary research demonstrates that certain preventive behavioral health interventions can produce cost savings or a cost offset (that is, the cost of the interventions is offset by savings from lower utilization of other services).
- MCO accreditation standards include requirements for some preventive behavioral health interventions. These requirements may increase as the evidence base expands.

X. Appendix B: Cost Analyses

The costs of mental disorders and substance abuse include the direct costs of treatment programs and services as well as the indirect costs of the loss of productivity in all aspects of an individual's life. For example, substance abuse–related costs are incurred in the direct treatment of the problem, treatment of medical conditions attributable to substance abuse, treatment of medical conditions for which substance abuse is a major risk factor, and extended lengths of stay due to complications arising from a secondary diagnosis of substance abuse (NIDA, 1998). Intangible costs include prevention of pain and suffering (Haddix, 1996). In general, costs are viewed as consumption of scarce resources that could have been used in other ways (CMHS, 1996c).

Currently, the four measures of cost impact that are most often addressed in the analysis of preventive interventions are cost-effectiveness, cost benefit, cost utility and cost offset. *Cost-effectiveness analyses* most often compare the cost per unit of outcome among alternative interventions that produce the same or similar effect; sometimes they compare the outcome of an intervention to no intervention (Haddix, Teutsch, Shaffer, & Duret, 1996). In the case of prevention, effectiveness is the avoidance of adverse outcomes. Cost-effectiveness is determined by dividing the net cost of an intervention by its net effectiveness (Teutsch, 1992). In this ratio, the denominator represents positive outcomes resulting from an intervention; the numerator represents the cost of obtaining those outcomes (Gold, Siegel, Russell, & Weinstein, 1996). A cost-effective intervention produces more positive outcomes than alternative uses of the resources (NIDA, 1998). One observer notes the following:

> "Cost-effectiveness" is a term that is often misunderstood and misused. The imprecision attached to the term "cost-effective" stems also from the variety of masters the concept serves. Purchasers of health care use the term to convey a careful assessment of the relative value of different healthcare services; producers of health care technologies and programs use the idea to support marketing claims; advocates for particular illnesses or constituencies use the term to garner resource investments. All of these parties are agreeing to the notion of value for money that is connoted by the term, and this notion does allow for common conceptual ground to be found.
>
> *(Gold et al., 1996, pp. xvii–xviii)*

While cost-effectiveness studies ask whether a preventive intervention is worth

the time, trouble, and incurred costs relative to other alternatives, *cost-benefit analyses* seek to determine, "Is prevention worth it?" (NIDA, 1998). When outcomes of preventive interventions are viewed as benefits, a monetary value is assigned to each outcome. Cost benefit is expressed as a ratio with the benefits as numerator and the costs as the denominator. Because the benefits of preventive interventions may include avoidance of pain and suffering and enhanced quality of life, the determination of monetary value can be a difficult and controversial process.

Cost-utility analyses focus on increased quality of life. Often expressed as cost per quality-adjusted life years (QALY), the net benefit is derived from calculating the number of life years saved, adding morbidity reduced and subtracting side effects reduced (Haddix et al., 1996). A newer variant of the QALY was created for the World Health Organization's *The Global Burden of Disease* (Murray and Lopez, 1996), called the Disability-Adjusted Life Years (DALY). This internationally standardized measurement expresses years of life lost due to premature death and years lived with a disability. This report projects that by the year 2020, depression will be the second leading burdensome disease worldwide (and in 1990 was ranked the fourth most burdensome). Another application of cost-utility analysis is in the measurement of immediate intervention outcomes, such as participation, satisfaction, and coordination with related services (NIDA, 1998).

Cost offset occurs when the provision of preventive behavioral health services results in reduced utilization of other health or social services—in other words, the cost of behavioral intervention offsets treatment or other costs that are incurred if a problem is not prevented. To date, relatively little discussion of cost offset exists in the prevention literature (NIDA, 1998). The cost of providing some mental health services can be offset in part or in full through a decline in the use of general medical services when mental health factors lead to unnecessary or ineffective health care utilization. The trend toward "carving out" mental health and substance abuse benefits (to be managed by large specialized proprietary companies) is causing concern because it may limit opportunities to achieve cost offset since the medical and surgical benefits where savings occur are managed separately:

> Mental health benefits that are carved out by the payer break the link between mental health and general financing. In these types of carve-outs, managed care plans lack a financial incentive to capture cost offsets and lose access to information about their subscribers' use of medical care services. Managed care companies that do not also manage mental health benefits have little incentive to pursue savings from cost offsets because this requires a substantial investment to develop the expertise to identify cases with high cost-offset potential.
>
> *(Olfson, Sing, & Schlesinger, 1999, p. 86)*

Some in the managed care environment are concerned about how much time is required for savings to be demonstrated. One researcher has suggested that there is a 2- to 3-year minimum lag period between health behavior change and cost reductions related to health improvements (Fries, Koop, Sokolov, Beadle, & Wright, 1998). If an MCO experiences frequent enrollee turnover, only short-term cost savings may provide sufficient incentive to motivate the provision of preventive behavioral health

services. On the other hand, a study found that voluntary disenrollment rates were higher in MCOs that offered fewer behavioral health promotion options (Stoil & Hill, 1998), which suggests that the availability of these services may increase enrollee satisfaction and retention. It may also provide a marketing tool for differentiating one MCO from its competitors (Mrazek, 1998).

It is unwise to overemphasize financial incentives as the only or best rationale for increasing the availability of preventive behavioral health services to managed care enrollees. While there may be evidence that a preventive service is highly cost-effective and contributes to quality of life, it may nonetheless cost more to implement than it saves (Satcher & Hull, 1995). In a book on prevention effectiveness, the authors refer to cost-effectiveness analysis as "an aid to decision-making, not a complete decision-making procedure" (Haddix et al., 1996). Other incentives to provide preventive behavioral health services must be identified.

XI. Appendix C: Literature Summaries

I. Prenatal/pregnancy studies

A. *Cost impact specified*

Reference 1: Marks, J. S., Koplan, J. P., Hogue, C. J. R., & Dalmat, M. E. (1990). A cost-benefit/cost-effectiveness analysis of smoking cessation for pregnant women. *American Journal of Preventive Medicine*, 6(5), 282–289.

Study question: What is the cost-effectiveness of a smoking cessation program for pregnant women to reduce low-birthweight and perinatal mortality?

Description of the study population: Estimates were applied to the 1986 birth cohort of 3,731,000 infants, of whom 783,510 were born to women who smoked during their pregnancy.

Design: After assessing the low-birthweight and perinatal mortality attributable to maternal smoking during pregnancy, investigators examined the costs of a smoking cessation program for the population of women in the United States who deliver babies each year. With 1986 as an index year, and using the Medical Care Price Index, all costs were adjusted to 1986 dollars. Because not all women enter prenatal care early, the model gave theoretical estimates of infant deaths and low birthweight that could be prevented. Smoking rates of 21% among pregnant women were estimated from the 1985–1986 Behavioral Risk Factor Surveillance System, based on a sample of American women from 25 states and the District of Columbia.

Description of intervention: The model program consisted of a single 15-minute counseling session, simple instructional materials for patients, and two followup telephone calls. It was assumed that a nurse or health educator would carry out the program.

Effectiveness of intervention: The model assumed a cessation rate of 15% based on a weighted analysis of previously published trials.

Cost impact of intervention: The model program was estimated to cost $30 per participant, not including biochemical testing of smoking status or clinicians' time in questioning patients during subsequent prenatal visits to confirm their smoking status since this is considered part of routine care. Costs were estimated at $5 per patient for instructional materials and $15 per hour for staff time for 30-minute telephone calls, including call-backs and chart completion. The cost of the staff and materials was increased by 25% to cover practice overhead and initial staff training. Assuming that 15% of participants would quit smoking, investigators determined that a program offered to all pregnant smokers would shift 5,876 low-birthweight infants to normal birthweight and would cost about $4,000 for each incidence of low birthweight prevented. Since infants born to smokers are at 20% greater

risk of a perinatal death, the author estimated that a smoking cessation program could prevent 338 deaths at a cost of $69,542 for each perinatal death averted. Compared with the costs of caring for these low-birthweight infants in a neonatal intensive care unit, smoking cessation programs could save $77,807,054, or $3.31 per $1 spent. The ratio of savings to costs increases to more than six to one when reductions in long-term care for infants with disabilities secondary to low-birthweight are included in the benefits from smoking cessation programs.

Reference 2: Olds, D. L., Henderson, C. R., Phelps, C., Kitzman, H., & Hanks, C. (1993). Effect of prenatal and infancy nurse home visitation on government spending. *Medical Care, 31*(2), 155–174.

Study question: Do improvements in maternal and child health associated with a prenatal and infancy nurse home visitation intervention translate into government savings (in terms of averted expenditures for other government services and increased tax revenues from participation in the workforce) compared to the incremental cost of the intervention (in terms of the difference between program cost and comparison services)?

Description of the study population: The study was conducted in and around Elmira, a small city with a population of 40,000 in a semirural area of central New York. Participants were recruited from a clinic offering free antepartum services sponsored by the county health department and the offices of private obstetricians. Five hundred women who met eligibility requirements were invited to participate in the study. Those who were eligible included pregnant women with no previous live births who could register before the 25th week of gestation and who had at least one of three sociodemographic risk characteristics: (1) under 19 years of age at registration, (2) unmarried, or (3) of low socioeconomic status as indicated by enrollment in Medicaid or having no private insurance. Of those recruited, 85% had at least one of the three risk characteristics: 48% were younger than 19 years, 62% were unmarried, and 59% were from households classified as low socioeconomic status. Eleven percent of the subjects were African American. Ultimately, 400 women were enrolled in the study.

Design: Families were randomized to one of four treatment conditions. Women were stratified by marital status, race, and seven geographic regions within the county. At 15-year followup, assessments were completed on 81% of participants originally randomized (N=324) and on 90% of participants for whom there was no miscarriage, stillbirth, death of mother or child, or child adoption. All treatment contrasts compared families in the comparison group (the combination of treatments 1 and 2) with those in treatment 4 (nurse visits during pregnancy and infancy), which was hypothesized to exert the greatest treatment effect.

Description of intervention: Children of families in treatment group 1 (N=94) received sensory and developmental screening at 12 and 24 months of age. These children were referred for further clinical evaluation and treatment when indicated. Families in treatment group 2 (N=90) received the services offered to treatment group 1 plus free taxicab vouchers for transportation to prenatal and well-child care through the child's second birthday. Families in treatment group 3 received the screening and trans-

portation services offered to those in group 2 as well as visits by a nurse at home during pregnancy. In treatment group 4 (N=116), families received the same services as those in group 3 except that visits from the nurse continued through the child's second birthday. The home visits focused on three aspects of maternal functioning: maternal health-related behaviors during pregnancy and the early years of a child's life, the care parents provided to their children, and maternal personal life-course development, including family planning, education and participation in the workforce. The nurses completed an average of nine visits (range, 0 to 16) during pregnancy and 23 visits (range, 0 to 59) from the child's birth to its second birthday.

Effectiveness of intervention: Nurse-visited unmarried women from low-socioeconomic households had fewer subsequent pregnancies (P=.02) and live births (P=.02) and greater spacing between first and second births (P=.001) than the comparison groups. They also reported using Aid to Families with Dependent Children (AFDC) and food stamps fewer months than did unmarried, low-socioeconomic women in the comparison group (P=.005 and P=.001, respectively). Since the birth of their first child, women in treatment group 4 also reported being impaired in fewer domains by alcohol or other drug use, having been arrested fewer times, and having spent fewer days in jail than their counterparts in the comparison group (P=.005, P<.001, P=.008 and P<.001, respectively). In contrast to women in the comparison group, those visited during pregnancy and the first 2 years of the child's life were identified as perpetrators of child abuse and neglect in fewer verified reports during the 15-year followup period (P<.001).

Cost impact of intervention: In 1980 dollars, the average per-family cost of the prenatal and infancy nurse home visitation program was $3,246 for the entire sample and $3,133 for low-income families. Government savings were defined as expenditures for AFDC, food stamps, Medicaid, and Child Protective Services, minus tax revenues due to maternal employment. By the time children in the study reached 4 years of age, government savings were $1,772 for the entire sample and $3,498 for low-income families. Within 2 years after the end of the program, net cost after discounting for the entire sample was $1,582 per family. The cost for low-income families was recovered with a dividend of $180 per family.

Reference 3: Windsor, R. A., Lowe, J. B., Perkins, L. L., Smith-Yoder, D., Artz, L., Crawford, M., Amburgy, K., & Boyd, N. R. (1993). Health education for pregnant smokers: Its behavioral impact and cost benefit. *American Journal of Public Health, 83*(2), 201–206.

Study question: What is the behavioral impact of health education interventions with pregnant smokers?

Description of the study population: Between 1986 and 1991, 1,171 pregnant smokers were screened at four maternity clinics of the Jefferson County Health Department in Birmingham, AL. Of that number, 110 (9.4%) were found to be ineligible for the study because they were not pregnant, were ineligible for care, entered into care after 32 weeks of pregnancy, did not stay for the first visit, did not return, were participants in an earlier study, were prisoners, or had trouble reading the baseline questionnaire. After 67 (6.3%) of the 1,061

eligible women refused participation, the remaining 994 were enrolled in the study.

Design: This was a prospective, randomized, pretest-posttest control group design to assess mid-pregnancy and end-of-pregnancy smoking status from self-reports and saliva cotinine tests. After giving informed consent at their first visit, the 994 pregnant smokers enrolled in the study were randomly assigned by a computer-generated system to the experimental group (493 patients) or control group (501 patients). After randomization, 93 experimental group and 87 control group patients became ineligible due to withdrawal from public health care, a miscarriage, or an abortion, leaving 814 smokers (400 experimental, 414 control) eligible for followup. Mean age was 24.6 years; mean education was 12.4 years; mean gestational age was 4.0 months; race was 52% black.

Description of intervention: There were three components. In the first component, a trained female health counselor spent 15 minutes on standardized cessation skills and risk counseling during the initial visit. Patients were taught how to use a 7-day, self-directed cessation guide with a sixth-grade reading level. In the second component, which focused on reinforcement, a chart reminder form was placed in the medical record and a medical letter was sent to patients within 7 days. In the third component, which focused on social support, patients received a buddy letter, a buddy contract, and a buddy tip sheet. A quarterly one-page newsletter with testimonials from successful quitters, additional risk information, and cessation tips was also mailed to patients. Every patient in the study received two pamphlets: "Smoking and the Two of You," which provided risk and benefit information about quitting, and "Where to Find Help If You Want to Stop Smoking," which contained contact names, phone numbers, and the costs of local programs. Finally, during a 20-minute group prenatal education class at the first visit, a nurse spent 2 minutes discussing smoking risks and the importance of quitting.

Effectiveness of intervention: The experimental group had a 14.3% quit rate compared with an 8.5% quit rate in the control group.

Cost impact of intervention: A cost-benefit analysis calculated cost-to-benefit ratios of $1:$6.72 (low estimate) and $1:$17.18 (high estimate) and an estimated savings of $247,296 (low estimate) and $699,240 (high estimate). Although a health counselor provided the intervention, a nurse would be the usual provider, so personnel costs for routine use of the 15-minute intervention including reinforcement were calculated based on an annual nurse's salary of $30,000 plus 20% fringe benefit rate at $4.33 per patient. The cost of materials, reproduction, and labor were estimated to be an additional $0.40, for a total cost of $6.00 per patient. The time spent during the first visit providing risk information and materials plus brief contacts at followup visits was calculated to cost an additional $1.50 per patient.

B. Cost impact not specified

Reference 4: Olds, D. L., Eckenrode, J., Henderson, C. R., Kitzman, H., Powers, J., Cole, R., Sidora, K., Morris, P., Pettitt, L. M., & Luckey, D. (1997). Long-term effects of home visitation on maternal life course and child abuse and neglect. *Journal of the American Medical Association, 278*(8), 637–643.

Study question: What are the long-term effects of a program of prenatal and early childhood home visitation by nurses on women's life course and child abuse and neglect?

Description of study population, description of intervention, design and effectiveness of intervention: See Olds et al., 1993 (reference 2).

Cost impact of intervention: Not addressed.

Reference 5: Ramey, C. T., & Ramey, S. L. (1992). Effective early intervention. *Mental Retardation, 30*(6), 337–345.

Study question: What are the long-term effects of a program of prenatal and early childhood home visitation by nurses on women's life course and child abuse and neglect?

Description of study population: Study 1: Subjects were children receiving early education intervention. Study 2: Subjects were mothers receiving home-based early intervention in addition to children participating in a center-based program. Study 3: Subjects were 1,000 children and families in 8 locations throughout the United States, with a focus on infants born prematurely and at low birthweight.

Description of intervention: Study 1: The intervention was early education. Study 2: The intervention was home-based, teaching mothers how to provide good developmental stimulation for their infants and toddlers, in addition to a full-day, center-based program for children 5 days per week. Study 3: The intervention consisted of home-based visits throughout the first 3 years and a center-based program for children between the ages of 1 and 3.

Design: Study 1 included an intervention group and a control group. Study 2 included a home-treatment group, a center-treatment group, and a control group. Children were randomly assigned to treatment conditions; those in the control group received free health and social services. In study 3, children and families were randomly assigned to receive either the early education intervention or control services (free additional medical and social services).

Effectiveness of intervention: In study 1, at 3 years of age, the IQs of children who received the early education intervention averaged 20 points higher than those of children in the control group; 95% of the children receiving early intervention scored in the normal IQ range compared with only 49% of control group children. The relative reduction of mental retardation via early education intervention was by a factor of 9.8. At 12 years of age, all of the early intervention group means were above the control group means. Early education intervention was associated with an almost 50% reduction in the rate of failing a grade during the elementary school years, which occurred among 55% of control group children versus 28% of intervention group children. Borderline intellectual functioning was reduced by a factor of 3.4, from approximately 44% for control children to 13% for the intervention children. In study 2, the home-visit treatment did not improve children's intellectual performance. In study 3, infants in both the smaller and larger low birthweight categories benefited from the intensive early intervention. In the control group, 17% of the children scored in the mentally retarded range, while in the intervention group, 13% of lower rate participants earned scores in this range, compared with 4% of medium participants and less than 2% of high participants.

The most active participants had an almost ninefold reduction in the relative incidence of mental retardation compared with the control group. By 3 years of age, 47% of control group children had IQs lower than 75, while only 23% of intervention group infants had scored that low.

Cost impact of intervention: Not addressed.

II. Infant studies

A. *Cost impact specified*

See Olds 1993, reference 2.

B. *Cost impact not specified*

Reference 6: Field, T. (1995). Infants of depressed mothers. *Infant Behavior and Development, 18*, 1–13.

Study question: What are the negative effects of maternal depression on infant behavior, growth, and development, and what is the effect of early intervention?

Description of the study population: Subjects were depressed mothers and their infants studied by multiple researchers.

Design: Not described.

Description of intervention: Interventions described in this article included attempts to alter the mother's mood state through music mood induction, visual imagery, aerobics, yoga, relaxation, and massage therapy. One study reviewed by the author compared the impact of having depressed adolescent mothers give their infants a massage versus having them rock their infants. Other interventions included in the review were interaction coaching and infant touching.

Effectiveness of intervention: Findings included the following: (1) After a 30-minute massage, anxiety levels and salivary cortisol levels decreased among depressed mothers studied. After two massages per week over a 4-week period, depression levels as well as urinary cortisol levels were significantly reduced. (2) After 20 minutes of music, 10 of 12 depressed adolescents had decreased salivary cortisol levels and positive changes in electroencephalogram activation. (3) Infants who received a massage from their mothers spent more time in active alert and active awake states, cried less, and had lower salivary cortisol levels than those who were rocked by their mothers 12 times for 15-minute periods over a 6-week period. They also gained more weight; improved on emotionality, sociability, and soothability temperament dimensions and face-to-face interaction ratings; and showed decreases in urinary stress hormones/catecholamines and increases in serotonin levels.

Cost impact of intervention: Not addressed.

Reference 7: Field, T., Grizzle, N., Scafidi, F., Abrams, S., & Richardson, S. (1996a). Massage therapy for infants of depressed mothers. *Infant Behavior and Development, 19*, 107–112.

Study question: What are the potential benefits of massage therapy for healthy infants born to depressed mothers?

Description of the study population: Subjects were 40 full-term, 1- to 3-month-old infants born to depressed adolescent mothers. The infants attended the investigators' daycare nursery from birth, when they were recruited for this research, and throughout the period of their study participation. The infants' birthweight and Apgar scores were normal. Their mothers were depressed, unmarried adolescents of low socioeconomic status who were on public assistance; 65% were African American and 35% were Hispanic. The diagnosis of depression followed the infant's delivery.

Of the mothers who met eligibility requirements at time of childbirth, 4% were no longer depressed at the time this research began (1 to 3 months postpartum) and thus were not recruited for the study.

Design: Infants were randomly assigned to a massage-therapy group or to a rocking control group. Mothers were unaware of which therapy their infants were receiving.

Description of intervention: Massage-therapy infants received a 15-minute massage midway between morning feedings 2 days per week for a 6-week period. In a supine position on a comfortable mat in a quiet area, a researcher trained in this technique placed a small amount of mineral baby oil on her palms and worked on the infant's face, chest, stomach, legs, feet, arms, and back in a prescribed manner. The rocking sessions occurred at the same time of day and for the same period of time as the massage therapy. The researcher held the infant in a cradled position and rocked in a rocking chair.

Effectiveness of intervention: Based on measurements 12 days after the study period began, compared with the rocking group, massage group infants gained weight; improved on temperament dimensions including emotionality, sociability, and soothability; and experienced decreases in urinary catecholamine and cortisol levels as well as increased serotonin levels.

Cost impact of intervention: Not addressed.

Reference 8: Field, T., Widmayer, S., Greenberg, R., & Stoller, S. (1982). Effects of parent training on teenage mothers and their infants. *Pediatrics, 69*(6), 703–707.

Study question: What is the comparative impact of a home-visit, parent-training program and a nursery parent-training intervention program provided for teenage mothers and their offspring during the first 6 months of infancy?

Description of the study population: Teenage mothers and their infants were recruited from a large university hospital neonatal nursery. They averaged 16.3 years of age, were African American and were of low socioeconomic status. Their infants were delivered at term without perinatal complications.

Design: Of the 120 mothers who agreed to participate in the longitudinal followup program, 40 were randomly assigned to each of three groups: home-visit intervention, nursery intervention, and control. Followup assessments were conducted at 4 months, 8 months, 1 year and 2 years.

Description of intervention: In the home-visit intervention program, a psychology graduate student and a trained teenage African-American CETA aide made biweekly home visits for 6 months to train mothers in infant stimulation. The visitors demonstrated six exercises per visit to mothers, provided illustrated cards of the exercises and toys, and watched mothers demonstrate the exercises to ensure that they understood them. Mothers were asked to practice each exercise for 5 minutes daily, to record the amount of time per day the exercises were practiced, and to record whether infants successfully performed them. At subsequent visits, mothers were asked to demonstrate these exercises and show the completed exercise cards. To minimize interruptions of the intervention, the CETA worker interacted with other family members present. The nursery intervention program provided parent training, job training, and an income for the teen-

age mothers, who served as teacher's aide trainees in an infant nursery that provided daycare for infants of medical school and hospital faculty and staff. The training was supported by CETA for 4 hours per day during the teenage mothers' nonschool hours over a 6-month period.

Effectiveness of intervention: In 4- and 8-month followup assessments, the infants of the intervention group mothers weighed more and received better developmental screening test scores than the control group infants. Interaction ratings for both mothers and infants in the intervention groups were better than the control group. This finding persisted at 1 year, and, in addition, the nursery-intervention infants received better motor scores than the home-visit intervention infants. The percentage of mothers returning to work or school was greater for the nursery group than for the home visit group, though this percentage was better for both intervention groups than the control group. At 2-year followup, both the number of mothers returning to work or school and the incidence of repeat pregnancy had increased for all three groups. However, the number of mothers returning to work or school was higher and the incidence of repeat pregnancy was lower for the nursery group than for the home-visit group, and those rates were higher and lower, respectively, for the home-visit group as compared with the control group.

Cost impact of intervention: The authors stated that the costs of the home-visit intervention program and the nursery intervention program were comparable, although the actual costs were not specified.

III. Studies of children to age 12

A. Cost impact specified

None identified.

B. Cost impact not specified

Reference 9: Beardslee, W. R., Salt, P., Versage, E. M., Gladstone, T. R. G., Wright, E. J., & Rothberg, P. C. (1997). Sustained change in parents receiving preventive interventions for families with depression. *American Journal of Psychiatry, 154*(4), 510–515.

Study question: Is it necessary for families to link cognitive information to family life experiences in order for sustained changes in behavior and attitudes to occur?

Description of study population: Subjects were 37 families (29 dual-parent, 8 single-parent) enrolled in a large prepaid HMO in the Boston, MA, area with at least one child between the ages of 8 and 15 who had never been treated for an episode of affective disorder and with at least one parent who had experienced an episode of an affective disorder in the previous 18 months. Exclusion criteria were current parental substance abuse, a history of parental schizophrenia, current severe marital crisis or other life crises, families currently in marital or family therapy more often than twice per month, and children whose parents reported that they had ever been affectively ill or who were in regular psychotherapy. The first 37 families that completed initial assessment, the intervention, and the first two postintervention assessments were included in the study group, which was predominantly white and middle class with a mean of 2.1 children per family. Fathers' mean age was 44.3 years; mothers' mean age was 41.1 years.

Description of intervention: (1) The clinician-facilitated intervention consisted of 6 to 10 sessions in which the clinician worked with the family to integrate life experiences and link illness experience to the cognitive information presented. This included a family meeting in which children joined parents and the clinician in a discussion of affective illness and miscommunication regarding the illness. (2) In the lecture intervention, similar cognitive information was covered in two lectures delivered in a group format with no children present and no direct linkage to the family's illness experience.

Design: Eligible families were randomly assigned to one intervention or the other. Time 1 assessments were completed before random assignment to interventions; time 2 assessments took place immediately after participation in an intervention, and time 3 assessments occurred approximately 1 year and 5 months after time 1.

Effectiveness of intervention: Participants in the clinician-facilitated intervention experienced greater behavior and attitude changes at both time 2 and time 3 and reported significantly greater levels of helpfulness of the intervention in addressing concerns than those in the lecture intervention, except for concerns about marital issues at time 3. Parents reported sustained benefit from both interventions, changes in illness-related attitudes and behavior and satisfaction with the interventions. Approximately 1.5 years after enrollment in the study, the clinician-facilitated intervention was associated with more self-reported and assessor-rated positive changes than the lecture intervention.

Cost impact of intervention: Not addressed.

Reference 10: Beardslee, W. R., Wright, E., Rothberg, P. C., Salt, P., & Versage, E. (1996). Response of families to two preventive intervention strategies: Long-term differences in behavior and attitude change. *Journal of the American Academy of Child and Adolescent Psychiatry, 35*(6), 774–782.

Study question: What is the long-term impact of two forms of preventive intervention designed to diminish risk to children in families in which one or both parents suffered from affective disorder? Do families receiving the clinician-facilitated intervention show increased and improved family communication, parental understanding of depression, and focus on the child compared with those receiving the lecture over a 3-year followup period?

Description of study population: Subjects were 28 families (54 parents) recruited from an HMO with at least one parent who had experienced an episode of affective disorder in the preceding 12 months, an absence of schizophrenia, no current substance abuse or marital crisis, and at least one child between the ages of 8 and 14 years who was not currently ill and had not been treated in the past for depression. Mean age of parents was 42.9; mean age of target children was 10.5. Of the original sample, 93% were retained through the fourth assessment.

Description of intervention: (1) The clinician intervention was composed of 6 to 10 sessions in a combination of couple, individual, and family meetings with either master's-level social workers or doctoral-level psychologists and focused on six core concepts: establishment of a therapeutic alliance; increased familial understanding of the parent's disorder and of risk and resiliency in

the children; clinician assessment of the child's strengths and vulnerabilities; validation of the child's experience; emphasis on the unique life experience of each family; and provision of long-term clinician availability. (2) The lecture intervention consisted of two lectures separated by 1 week, delivered by a physician, including information about depression, its biological basis, the need for treatment, and vulnerabilities and strengths in children growing up in homes with parents with affective disorder.

Design: Families were randomly assigned to either the clinician or the lecture intervention. There was a preintervention assessment and three postintervention assessments at 3 to 6 weeks, 9 to 12 weeks, and 2 years postintervention.

Effectiveness of intervention: Ratings of degree of upset about reported concerns declined across time for families in both intervention groups. Families receiving the clinician-facilitated intervention reported more behavior and attitude changes than did lecture-group families when assessed after intervention. The difference between the two groups was sustained at further followup assessments. Data supported the hypothesis that linking cognitive information to the family's life experience produces long-term changes.

Cost impact of intervention: Not addressed. (Changes were hypothesized to result, over a 4- to 8-year followup, in fewer episodes of illness in children, more rapid recognition of and response to symptoms and signs of distress, and the seeking of prompt and appropriate treatment when a diagnosable disorder occurred.)

Reference 11: Beardslee, W. R., Wright, E. J., Salt, P., Drezner, K., Gladstone, T. R. G., Versage, E. M., & Rothberg, P. C. (1997). Examination of children's responses to two preventive intervention strategies over time. *Journal of the American Academy of Child and Adolescent Psychiatry, 36*(2), 196–204.

Study question: What are the long-term effects of two forms of preventive intervention designed to increase families' understanding of parental affective disorder and to prevent depression in children?

Description of study population: Thirty-six families who had a nondepressed child between the ages of 8 and 15 years and a parent who had experienced affective disorder were recruited from a large prepaid HMO in the Boston, MA, area. Exclusion criteria were current parental substance abuse, history of parental schizophrenia, current severe marital crisis or other life crises, current marital or family therapy more frequently than once per month, and children in weekly psychotherapy. The study group included the first 36 families to complete the initial assessment, the intervention, and the second postintervention assessment, which occurred an average of 69.3 weeks after enrollment.

Description of intervention: (1) A clinician-facilitated group consisted of 6 to 10 sessions in a combination of meetings with only parents, individual meetings with each child, and a family meeting. (2) A lecture discussion group consisted of two 1-hour standardized lectures by a physician with time for questions and group discussion; children did not attend.

Design: Families were randomly assigned to an intervention. Assessments occurred before randomization, after the intervention, and about 1.5 years after enrollment.

Effectiveness of intervention: Children in the clinician-facilitated group reported

greater understanding of parental affective disorder and had better adaptive functioning after intervention. Parents in the clinician-facilitated intervention group reported significantly more change. Findings from both interventions supported the value of a future-oriented resiliency-based approach. The greater effects of the clinician-facilitated intervention supported the need for linking cognitive information to families' life experience and involving children directly in order to achieve long-term effects.

Cost impact of intervention: Not addressed.

Reference 12: Durlak, J. A. (1998). Common risk and protective factors in successful prevention programs. *American Journal of Orthopsychiatry, 68*(4), 512–520.

Study question: What are the common risk and protective factors that emerge from successful prevention programs for children and adolescents?

Description of the study population: Subjects were children and adolescents.

Design: The author reviewed approximately 1,200 prevention outcome studies in six areas—behavioral and social problems, academic problems, child maltreatment, physical injuries, drug use, and physical health problems—that encompassed cardiovascular health, nutrition, physical exercise, adolescent pregnancy, sexuality, and AIDS. The review particularly focused on exemplary studies defined as successful interventions that were carefully conceptualized, conducted, and evaluated.

Description of intervention: Not addressed.

Effectiveness of intervention: The author stated that many of the interventions in the reviewed studies significantly reduced the subsequent rate of problems, enhanced positive adjustment, or both, providing justification for intervening promptly for problems that are detected early. The eight major outcomes analyzed were behavioral problems, school failure, poor physical health, physical injury, physical abuse, pregnancy, drug use, and AIDS. The author reported that multilevel interventions have shown the most impressive results. Specific examples of positive findings included (1) interventions to improve parenting associated with better parent-child relationships and reduced adolescent drug use; (2) a multilevel drug prevention program that led to a 19% reduction in adolescent alcohol use over a 3-year period; (3) early-childhood programs that prevented later learning problems and serious antisocial behavior; (4) mental health programs that reduced subsequent behavioral maladaptation and improved school performance; and (5) physical health programs that reduced later illnesses and levels of physical abuse or behavioral problems.

Cost impact of intervention: Not addressed.

Reference 13: Durlak, J. A.,& Wells, A. M. (1998). Evaluation of indicated preventive intervention (secondary prevention) mental health programs for children and adolescents. *American Journal of Community Psychology, 26*(5), 775–802.

Study question: What are the outcomes of indicated preventive intervention (secondary prevention) mental health programs designed to identify early signs of maladjustment and to intervene before full-blown problems develop in children and adolescents?

Description of the study population: Subjects were youth age 18 or under participating in secondary prevention outcome studies. The typical participant was in elementary school; 29% of the studies

reviewed involved adolescents 13 through 18 years of age.

Design: This was a meta-analysis of 99 published reports and 22 unpublished doctoral dissertations that defined secondary prevention as intervention for children with subclinical problems that were discovered through a population-wide screening approach; involved a control group drawn from the same population as the treated group; and was directed primarily at children's or adolescents' behavioral and social functioning. The following methodological features characterized a percentage of the studies reviewed: random assignment, 70.6%; attention placebo controls, 28.1%; attrition less than 10%, 76.2%; followup data collected, 26.9%; multiple outcome measures used, 90.9%; normed outcome measure used, 20.3%; generalized impact of treatment assessed, 36.6%.

Description of intervention: Interventions were environment-centered (school-based, parent training); transition programs (divorce, school entry/change, first-time mothers, medical/dental procedure); or person-centered (affective education, interpersonal problem solving, or other person-centered programs using behavioral or nonbehavioral approaches). Interventions were behavioral (46), cognitive-behavior (31) or nonbehavioral (53).

Effectiveness of intervention: The authors concluded that programs such as those reviewed significantly reduce problems and significantly increase competencies. Behavioral and cognitive-behavior programs for children with subclinical problems appeared to be as effective as psychotherapy for children with established problems and more effective than attempts to prevent adolescent smoking, alcohol use, and delinquency. The average participant receiving behavioral or cognitive-behavior intervention surpassed the performance of approximately 70% of those in a control group. A high mean effect (0.72) was achieved by programs targeting incipient externalizing problems, which are customarily the least amenable to change through traditional psychotherapeutic efforts when they reach clinical levels.

Cost impact of intervention: Not addressed.

Reference 14: Durlak, J. A., & Wells, A. M. (1997). Primary prevention mental health programs for children and adolescents: A meta-analytic review. *American Journal of Community Psychology, 25*(2), 115–151.

Study question: What is the impact of primary prevention programs designed to prevent behavioral and social problems in children and adolescents?

Description of the study population: Subjects were youth 18 years of age or under participating in primary prevention outcome studies. The mean age of participants was 9.3 years; 13% of studies involved adolescents between the ages of 13 and 18.

Design: This was a meta-analysis of 150 published reports and 27 unpublished doctoral dissertations that defined primary prevention as an intervention designed specifically to reduce the future incidence of adjustment problems in currently normal populations, including efforts that were directed at the promotion of mental health; involved a control condition of some sort; were reported by the end of 1991; and had a central mental health thrust. Of the studies reviewed, 61% used randomized designs; 22.6% used attention placebo controls. Attrition was less than 10% in 80% of the studies. More than one-quarter of the studies

(25.4%) provided followup data. Almost all researchers used multiple outcome measures (89.9%); 33.8% used normed outcome measures.

Description of intervention: Interventions were environment-centered (school-based, parent training); transition programs (divorce, school entry/change, first-time mothers, medical/dental procedure); or person-centered (affective education, interpersonal problem solving, or other person-centered programs using behavioral or nonbehavioral approaches). The primary settings were schools (72.9%), general hospitals or dental clinics (14.9%), and home (2.2%). In 7.8% of the studies, a combination of these settings were used; in 2.2%, the setting was not reported.

Effectiveness of intervention: Programs modifying the school environment, individually focused mental health promotion efforts and attempts to help children negotiate stressful transitions yielded significant mean effects ranging from 0.24 to 0.93. The average participant in a primary prevention program surpassed the performance of between 59% to 82% of those in a control group, and outcomes reflected an 8% to 46% difference in success rates favoring prevention groups. Most categories of programs significantly reduced problems, significantly increased competencies, and affected functioning in multiple adjustment domains.

Cost impact of intervention: Not addressed.

Reference 15: Finney, J. W., Riley, A. W., & Cataldo, M. F. (1991). Psychology in primary health care: Effects of brief targeted therapy on children's medical care utilization. *Journal of Pediatric Psychology, 16*(4), 447–461.

Study question: What is the impact of psychological treatment for children with common behavior, toilet, school, and psychosomatic problems?

Description of the study population: Subjects were 93 children (59 boys, 34 girls) between the ages of 1 and 15 (average age 6.4) scheduled for evaluation appointments in the Behavioral Pediatrics Service of an HMO.

Design: A same-size comparison group was selected from the HMO membership using the computerized patient database and encounter system matched on age, gender, and completion of a pediatric primary care encounter on the same day as a treated child. Parents of treated children were contacted 3 or 6 months after termination of treatment for followup information.

Description of intervention: Doctoral-level pediatric psychologists or predoctoral clinical psychology interns with supervised treatment responsibility provided one to six targeted therapy sessions about 50 minutes in length to children experiencing common behavior and emotional problems along with their parents. Using a behavioral model of therapy, parents were helped to define problems in terms of the child's behavior and the parent's response to desired and undesired behaviors. Treatment goals were an increase in desired behaviors and a decrease in problem behaviors. Written guidelines that included brief therapeutic rationales and specific recommendations based on written, problem-specific protocols were given to parents. Most parents received planned telephone calls to ensure adequate implementation of recommended therapeutic techniques and to troubleshoot problems. When appropriate, schoolteachers or counselors were also involved in treatment programs.

Effectiveness of intervention: Referral problems were resolved (according to 30% of parents) or improved (according to 46% of parents); thus, 24% of parent-reported problems were unchanged or worsened. Children with behavior problems reduced their medical encounters by almost a third, while those with toilet problems reduced their medical encounters by almost one-half. Children with psychosomatic problems showed a nonsignificant increase in medical encounters, while children with school problems showed only a small, nonsignificant reduction in medical encounters. The matched comparison group's utilization was unchanged.

Cost impact of intervention: Although cost information was not provided, authors speculated that there was an offset in medical care use because children's and parents' previously unmet needs were resolved through the brief targeted therapies.

Reference 16: Mullen, P. D.& Zapka, J. G. (1981). Health education and promotion in HMOs: The recent evidence. *Health Education Quarterly, 8*(4), 292–315.

Study question: What are the results of selected health education studies that were conducted in HMOs or that are applicable to HMOs?

Description of study population: Subjects were primarily adults, though some studies involved children and families.

Description of intervention: Interventions included group education, telephone and postcard reminders of return appointments, home visits, childbirth preparation classes, individual and group counseling sessions, parent counseling programs, clinical algorithms, and self-care centers.

Design: Not described.

Effectiveness of intervention: Outcomes included reduced emergency-room utilization for people with asthma; decreases in diabetic ketoacidosis and amputation, and reduced hospital admissions for persons with asthma; reduced rehospitalizations for hospitalized patients; reduced broken appointment rates; reduced medication requirements and length of postoperative hospital stays; decreased use of pain medication; and higher rates of spontaneous vaginal deliveries.

Cost impact of intervention: Not addressed.

Reference 17: Roter, D. L., Hall, J. A., Merisca, R., Nordstrom, B., Cretin, D., Svarstad, B. (1998). Effectiveness of interventions to improve patient compliance. *Medical Care, 36*(8), 1138–1161.

Study question: What is the effectiveness of interventions to improve patient compliance with medical regimens?

Description of study population: Authors reviewed 153 studies: 55 involving adult subjects over age 18 and under age 65, 7 involving subjects over age 65, 59 involving mixed populations of adults and elderly persons, 22 directed toward children or adolescents or their caretakers, and 10 targeting providers.

Description of intervention: Interventions were as follows: (1) individualized educational strategies (oral, audiovisual, visual, written, telephone education, mail, or home visits) or group education strategies (group, family, or inpatient); (2) behavioral strategies (monitoring medication; feedback; graphing compliance; computerized emergency room discharge; skill building; group skill building; contracting; packaging; dosage; tailoring; transdermal medications; demonstration dose; and memory aids such as stickers, scheduled appointments, medical diaries, calendars, obtrusive pill counts, rewards, mailed

reminders, telephone reminders, and telephone followup); (3) affective strategies (home visits, family support, family contract, or in-depth or group counseling); or (4) provider-focused intervention (physician education, pharmacist education, physician updated on patient status, physician reminders, or nurse education).

Design: This was a meta-analytic review synthesizing compliance studies that met six criteria: (1) included at least one intervention to influence or improve compliance with therapeutic regimens; (2) included a control group; (3) included quantitatively measured compliance with therapeutic recommendations or a health problem linked to compliance; (4) reported the association between compliance and at least one intervention variable, or provided enough information to calculate this association; (5) had a sample size of at least 10; and (6) was published in an English-language journal between 1979 and 1994.

Effectiveness of intervention: Compliance outcomes included health outcome indicators (blood pressure, survival, hospitalization, dental outcome, pain, asthma severity, relapse, or ear infection); direct measures (tracer substances and physiologic indicators such as blood glucose, urine tracers, and cholesterol as well as anatomic changes such as body fat and weight change); indirect measures (pill counts, prescription refills, or use of mechanical or electronic monitors of pill or drug use); subjective measures (patients' or others' report of compliance and chart review); and utilization indicators (appointment making; appointment keeping; and participation in or utilization of preventive services such as Pap, colon screening, mammography, and vaccinations). Authors reported that the interventions produced significant effects for all compliance indicators. The largest unweighted effects were for refill records and pill counts and in blood, urine, and weight change studies. Although small in magnitude, compliance effects were evident for improved health outcomes and utilization. Chronic disease patients, including those with diabetes and hypertension, as well as cancer patients and especially individuals with mental health problems benefited. No single strategy was clearly more advantageous than any other; comprehensive interventions that combined cognitive, behavioral, and affective components were more effective than single-focus interventions.

Cost impact of intervention: Not addressed.

IV. Studies of adolescents ages 13 to 17

A. Cost impact specified

None identified.

B. Cost impact not specified

Reference 18: Clarke, G. N., Hawkins, W., Murphy, M., Sheeber, L. B., Lewinsohn, P. M., & Seeley, J. R. (1995). Targeted prevention of unipolar depressive disorder in an at-risk sample of high school adolescents: A randomized trial of a group cognitive intervention. *Journal of the American Academy of Child and Adolescent Medicine, 34*(3), 312–321.

Study question: Can unipolar episodes in a sample of high school adolescents with an elevated risk of depressive disorder be prevented?

Description of the study population: The initial sampling frame included 1,652 9th- and 10th-grade adolescents in three suburban high schools. Of those, 172

students were qualified for the study; 150 (87.2%) chose to participate; 70% were female.

Design: Participating students were randomly assigned to the prevention group or the usual care control group.

Description of intervention: The preventive intervention was a 15-session, after school, cognitive group program led by specially trained school psychologists and counselors with a minimum of a master's degree in clinical, counseling, or education psychology and previous experience in conducting psychoeducational groups with adolescents. Participants were taught cognitive restructuring techniques to identify and challenge irrational or highly negative thoughts that might contribute to depression. In the usual care condition, adolescents were free to continue with any preexisting intervention or to seek any new assistance during the study period. There was a 1-year followup.

Effectiveness of intervention: A continuing advantage for participants in the cognitive group intervention was detected across the 12-month followup period, with a total incidence of unipolar depressive disorder in approximately half of the control group. The intervention did not result in complete prevention of affective disorder; however, even in the experimental condition, the 1-year total depressive disorder incidence was almost twice the rate observed in unselected community samples.

Cost impact of intervention: Investigators were unable to examine whether the relatively low costs of delivering this group intervention offset the relatively high potential costs of inpatient or outpatient treatment that might have been utilized by some of the individuals for whom episodes of depression were prevented.

Reference 19: Eakin, E., Severson, H., & Glasgow, R. E. (1989). Development and evaluation of a smokeless tobacco cessation program. *NCI Monographs*, (8), 95–100.

Study question: Is a multicomponent treatment program efficacious and feasible in aiding male adolescents to quit using smokeless tobacco?

Description of the study population: Subjects were 25 of 34 males contacted by telephone (73.5%) who were between the ages of 14 and 18 and who had used smokeless tobacco regularly for an average of almost 3 years. They were referred from local high schools by counselors, health teachers, coaches, and dentists.

Design: This was a within-subject, replicated AB design with a quasi-experimental comparison group of 11 subjects for whom treatment was delayed. Self-report of smokeless tobacco use was verified through saliva cotinine analysis.

Description of intervention: Three small-group meetings lasted 60 to 90 minutes, each with two to six participants and two to three counselors. One counselor was a psychologist and research scientist in charge of the study; the other two were advanced undergraduate research assistants trained in cessation counseling. There was a 1-week interval between the first two meetings and a 2-week interval between the last two meetings. Session one included a program orientation and emphasized two primary treatment components: motivation to quit and acquisition of coping skills. Participants were asked to view a video about smokeless tobacco with their parents prior to the second meeting. Sessions two and three focused on progress in quitting, successes, and difficulties. Phone calls were made to participants between sessions and for 3 months

after treatment. Participants were paid $10 at the end of the program whether or not they quit, $5 to participate in each 3-month followup session and $10 to attend the 6-month post-treatment meeting.

Effectiveness of intervention: Of the 21 subjects completing the program, 9 (43%) had quit by the final session. At the end of the program, even nonquitters had reduced their use of smokeless tobacco by 77% from baseline levels. Basing abstinence estimates on all subjects who began treatment and required biochemical verification, a 6-month cessation rate of 12% was achieved. Those subjects who did not achieve abstinence reduced their daily used of smokeless tobacco by 45% from baseline levels. Quitters had a significantly lower average number of dips per day at baseline than those who did not quit (4.4 vs. 6.4, P<.05). Eight of nine quitters (88%) were high school athletes, compared with 38% of the nonquitters (P=.022). Of the 5 subjects who were daily smokers, only 1 was successful in quitting his smokeless tobacco use, compared with 8 of 16 nonsmokers.

Cost impact of intervention: Not addressed.

Reference 20: Field, T., Grizzle, N., Scafidi, F., & Schanberg, S. (1996b). Massage and relaxation therapies' effects on depressed adolescent mothers. *Adolescence, 31*(124), 903–911.

Study question: What are the comparative effects of massage and relaxation therapies on depressed adolescent mothers?

Description of the study population: Recruited from a large inner-city hospital's maternity ward, 32 depressed adolescent mothers who had recently given birth comprised the study population. The sample was 71% African American and 29% Hispanic.

Design: Subjects were randomly assigned to the massage therapy or relaxation therapy group.

Description of intervention: The massage therapy group received 30-minute mid-afternoon massages from a trained massage therapist—2 consecutive days per week for 5 consecutive weeks. The subjects were in a supine position for the first 15 minutes and a prone position for the second 15 minutes. The other group attended relaxation therapy sessions of the same length and on the same schedule as the massages. Using exercise mats, subjects participated in yoga exercises for the first 15 minutes and progressive muscle relaxation for the second 15 minutes.

Effectiveness of intervention: While both groups reported reduced anxiety following their first and last sessions, only the massage therapy group showed behavioral and stress hormone changes, including a decrease in anxious behavior, pulse and salivary cortisol levels. The massage therapy group also had decreased urine cortisol levels at the end of the 5-week intervention period.

Cost impact of intervention: Not addressed.

Reference 21: Rosen J. C.& Wiens, A. N. (1979). Changes in medical problems and use of medical services following psychological intervention. *American Psychologist, 34*(5), 420–431.

Study question: Can psychological services reduce medical problems and use of medical facilities?

Description of the study population: The subject pool included all patients referred to the Medical Psychology Outpatient Clinic at the University of Oregon Health Sciences Center from January 1, 1970, to July 15, 1975, who had a clinic card, were eligible

for care and had used medical services for at least 1 year before the first appointment for psychological consultation, who were referred to the clinic by another clinic or service (except the department of psychiatry) in the health sciences center, and who had no previous contact with the departments of medical psychology or psychiatry. Subjects who had obtained a substantial number of medical services at another facility were also excluded. Of the 468 individuals enrolled in the study, 267 (57%) were male and 201 (48%) were female; 247 were under age 16, while 221 were 16 years of age or older. The study population was 89% white and had an average age of 20.

Design: Subjects were assigned to one of four groups: evaluation and treatment, evaluation, referral not kept, or not referred. Patients in the latter group were selected by matching 100 randomly selected, nonreferred patients to 100 randomly selected, referred patients from the other three groups. Matching criteria were year of admission to the Health Sciences Center, possession of a clinical services entry card, and use of Health Sciences Center clinics and hospitals as sources of medical care.

Description of intervention: Subjects in the evaluation and treatment group received a comprehensive intake interview, diagnostic evaluation, and appropriate therapeutic intervention in the Medical Psychology Outpatient Clinic. Subjects in the evaluation group received a comprehensive interview and diagnostic evaluation in the clinic. Subjects in the referral not kept group received a referral to the clinic for services but never kept their scheduled appointments. Subjects in the not referred group had no referral to or contact with the clinic. Subjects referred to the clinic were seen by one of the following: a faculty member of the department of medical psychology, a first- or second-year postdoctoral resident, or an intern in medical psychology. Children under age 16 were seen for child psychology services; the rest of subjects in intervention groups received adult psychology services.

Effectiveness of intervention: Significant group effects were found for changes in the number of medical outpatient visits ($P<.001$), pharmaceutical prescriptions ($P<.05$), and diagnostic services ($P<.05$). For each of these three measures of use, the two groups receiving psychological services declined significantly when compared with the two groups that did not receive those services. The two intervention groups did not differ from each other with respect to these decreases. The evaluation-only group demonstrated the most consistent reduction, as declines were found in medical outpatient visits, pharmaceutical prescriptions, emergency room visits, and diagnostic services. Patients who received evaluation and treatment made significantly less use of medical outpatient visits and pharmaceutical prescriptions. When psychological treatment sessions were combined with medical appointments, the mean for the year-after number of outpatient visits for the evaluation and treatment group increased from 3.37 to 10.62, but the decrease found previously for patients in the evaluation-only group persisted even with the addition of the medical psychology evaluation session ($P<.01$). Among patients seen for psychological services, days hospitalized decreased by 35%, medical outpatient visits decreased by 41% and medical outpatient visits and diagnostic services decreased by 40%.

Cost impact of intervention: Not addressed, but authors suggested that the

cost of actively using medical psychologists may be offset by a reduction in medical services utilization.

Reference 22: Tobler, N. S. (1992). Drug prevention programs can work: Research findings. *Journal of Addictive Diseases, 11*(3), 1–28.

Study question: How effective are drug prevention programs for adolescents?

Description of the study population: Subjects were adolescent participants in 143 programs aimed at reducing teenage drug use and abuse.

Design: The authors conducted a meta-analysis of 143 adolescent drug prevention programs from published and unpublished reports; public and private efforts; and national, state, and local partnerships. Of these programs, 48.9% had an experimental design; 51.1% were quasi-experimental.

Description of intervention: Strategies included knowledge only, affective only, peer programs (refusal, social, and life skills), knowledge plus affective, and alternatives (activities, competence).

Effectiveness of intervention: In terms of effect sizes for outcome measures, knowledge-only programs showed success with knowledge outcomes but negligible change for attitudes and drug use. Affective-only programs were ineffective; knowledge plus affective had a modest effect on knowledge outcomes only. Peer programs produced the highest effect size for all measures (knowledge, attitudes, drug use, and skills) except behavior. With regard to drug use, peer programs were significantly different from the combined results of other programs ($P<.0005$) and proved to be the most efficient; half of the peer programs achieved positive gains in 10 or fewer hours. Peer programs had an effect on cigarette smoking, alcohol use, marijuana use, and hard drug use. Alternative programs, offered primarily to at-risk youth, had superior results on skills and the highest effect size for behavior.

Cost impact of intervention: Not addressed.

V. Family studies

A. *Cost impact specified*

See reference 2.

B. *Cost impact not specified*

Reference 23: Aktan, G. F., Kumpfer, K. L., & Turner, C. W. (1996). Effectiveness of a family skills training program for substance use prevention with inner city African-American families. *Substance Use & Misuse, 31*(2), 157–175.

Study question: How effective is a family skills training program for African-American families in preventing substance abuse?

Description of study population: Potential participants were African-American parents admitted to treatment for substance use at the Salvation Army Harbor Light Residential Drug and Alcohol Treatment Center in Detroit, MI. Qualified parents were those living within the city of Detroit with children ranging from 6 to 12 years old. It was necessary for all family members to acknowledge the importance of regaining stability in their families and to commit to participating in the full 12-week Safe Haven Program as part of the overall treatment. The 88 parents had 88 children (49 males, 39 females) in the eligible age range. About 41% of the children were in the fourth grade or higher; 27% were in the second or third grade; and 32% were in the first grade or kindergarten. About half of the children had repeated at least 1 year in school. Of

the parents, 35% had graduated from high school; 63% were Baptist; 73% were unemployed; 68% had household income under $15,000; 58% had income from welfare; and 57% had two to three children under age 18 in their households.

Description of intervention: Three self-contained courses in the 12-week Safe Haven Program were conducted simultaneously: parent training, children's skills training: and family skills training. During parent training, appropriate methods for coping with their children's problem behaviors and for increasing the number of positive interactions with children were taught. The children's skills training focused on a variety of prosocial skills including coping with loneliness, making choices, controlling anger, recognizing feelings, and dealing with peer pressure. Both the parents and children were involved as a family unit in the family skills training, in which parents learned to set appropriate limits and to reward good behaviors. Trainers were male and female African-American substance abuse counselors who participated in a 3-day training in the program philosophy and curriculum followed by periodic observations.

Design: This intervention was evaluated through a nonequivalent comparison quasi-experimental design with repeated measures and pre- and posttest parent and child interviews. Only one child per family could be included in the outcome evaluation because of the extensive nature of the test battery. Most of the families with more than one eligible child chose the child with whom they needed most assistance for participation in the program. Evaluation methods included a pretest and posttest as well as a 6- and 12-month followup.

Effectiveness of intervention: In the early months of implementation, approximately half of participating families completed the program; this rose to and remained at 80% for the rest of the 16-month program period. The program had significant positive effects on the parents, the children and the families. More improvements in children's risk and protective factors were noted in children of high-drug-using parents than those of low-drug-using parents. The parents in both groups reported a significant decrease in illegal drug use in the family ($P<.002$) and in their own drug use ($P<.000$). There were also significant decreases in depression in the total sample ($P<.024$) and in the high drug-using group ($P<.006$). Significant improvement in perceived efficacy as parents was reported in high drug-use parents ($P<.002$) as well as in the total sample ($P<.002$). Among children, primarily those in the high-drug-using families, significant improvements were found in aggression ($P<.006$), hyperactivity ($P<.003$), schizoid scores ($P<.03$), depression ($P<.001$), uncommunicativeness ($P<.032$), and obsessive-compulsive behavior ($P<.018$). Parents also reported increased school bonding ($P<.001$) and increased time spent on homework ($P<.032$). Program effects on the family unit were weakest, with only the family cohesion scale showing significant improvement ($P<.029$).

Cost impact of intervention: Not addressed.

Reference 24: Field, T. M., Scafidi, F., Pickens, J., Prodromidis, M., Pelaez-Nogueras, M., Torquati, J., Wilcox, H., Malphurs, J., Shanberg, S., & Kuhn, C. (1998). Polydrug-using adolescent mothers and their infants receiving early intervention. *Adolescence, 33*(129), 118–143.

Study question: What are the effects of an intervention for polydrug-using adolescent mothers on the mothers and their drug-exposed infants?

Description of study population: In the sample were 126 young mothers between the ages of 16 and 21 of low socioeconomic status; 64% were African American, 27% were Hispanic and 10% were non-Hispanic white. They averaged 10.3 years of education. Their infants were assessed at 3, 6, and 12 months of age.

Description of intervention: The 4-month intervention program consisted of drug and social rehabilitation, parenting and vocational classes, and relaxation therapy. The mothers attended high school or graduate equivalency diploma (GED) preparation classes and participated in the intervention afternoons at the vocational high school they attended. They also spent 1 to 2 hours per day in the nursery, which provided enrichment for 12 infants. The outpatient drug rehabilitation curriculum consisted of group therapy, psychoeducational sessions, urine monitoring, self-help groups, and individual and drug counseling. Group therapy sessions focused on denial of drug use, problem-solving, coping skills, altering lifestyles and the 12-step philosophy. Included in the psychoeducational sessions were presentations on addiction theories, medical complications of substance dependency, family relation skills, assertiveness training, empowerment, HIV and AIDS, sex education and sexually transmitted diseases, 12-step programs, spirituality and accessing health care, and social and vocational services. Weekly 2-hour parenting classes educated the mothers about developmental milestones and child-rearing practices and taught them exercises; age-appropriate stimulation methods for facilitating sensorimotor and cognitive development of their infants; and ways to develop communication skills and foster harmonious mother-infant relationships. When possible, women were placed in vocational training programs before the end of the intervention and assisted in finding stable living arrangements and affordable daycare for their infants. The 2-hour weekly social rehabilitation group focused on daily living tasks and problems with social support; living arrangements; school; parenting; and relationships with parents, friends, infants, and other group members. Parents, boyfriends, and friends were invited to attend when appropriate. Relaxation therapy included progressive muscle relaxation, music mood induction and visual imagery, massage therapy, and aerobics classes.

Design: Drug control, drug rehabilitation, and nondrug groups of mothers and their infants were compared, with measurements at 3, 6, and 12 months.

Effectiveness of intervention: Initially, the drug groups had higher depression and stress scores, and their infants received inferior scores on habituation, orientation, abnormal reflexes, general irritability, and regulatory capacity. Those infants also had less quiet sleep and exhibited more frequent crying and stress behaviors. Three months after the intervention began, mothers and infants in the intervention group and nondrug group had superior interaction ratings to the drug control group and physical findings suggestive of lower stress levels. At 6-month followup, the intervention group was beginning to approximate the nondrug group in terms of depression and mother-infant interaction. Also, infants in the drug rehabilitation group and nondrug group had superior scores on head circumference and pediatric complica-

tions. At 12 months, the drug rehabilitation group showed less depression and stress than the drug control group, as well as a lower incidence of repeat pregnancy and continued drug use. In addition, a higher percentage of them were still in school, had received their GED or diploma, and had been placed in jobs. Their infants' social communication scale scores were similar to those of the non-drug group and significantly better than the drug control group.

Cost impact of intervention: Not addressed.

VI. Studies of adults ages 18 to 64

A. *Cost impact specified*

Reference 25: Altman, D. G., Flora, J. A., Fortmann, S. P., & Farquhar, J. W. (1987). The cost-effectiveness of three smoking cessation programs. *American Journal of Public Health, 77*(2), 162–165.

Study question: What is the cost-effectiveness of three smoking cessation programs?

Description of study population: Subjects were participants in the Stanford [CA] Five City Project. Participating in a class were 541 smokers: mean age 44.6 years, 66.3% female, mean education 13.5 years. Participating in a self-help intervention were 101 smokers: mean age 47.0 years, 67.3% female, mean education not available. Participating in a contest were 498 smokers: mean age 38.2 years, 55.4% female, mean education 13.6 years.

Description of intervention: (1) A smoking cessation class was implemented by the county health department, consisting of eight 1-hour sessions offered once per week for 5 consecutive weeks, then every other week. Quitting techniques included behavioral problem-solving, self-monitoring, tapering, deep muscle relaxation, goal setting, and group social support. (2) In a 6-week incentive-based smoking cessation contest, smokers attempted to quit by a predetermined day to qualify for a random drawing for prizes; nonsmoking status was verified by a carbon monoxide assessment. (3) A four-step, self-help quit kit contained four "tip sheets" and a heart-shaped magnet for posting them. There were seven major categories of cost: staff and staff benefits, overhead, rent, supplies and materials, travel, data analysis, and time required from participating smokers.

Design: The type of intervention was self-selected by participants.

Effectiveness of intervention: Quit rates by intervention were as follows: self-help, 21%; contest, 22%; class, 35%.

Cost impact of intervention: Costs were calculated for development, promotion, implementation, and evaluation; a discount rate of 5% was applied to cost outlays in each program year. Cost per quitter was estimated by dividing the total cost of each program at 1 year and 5 years by the number of people who would be expected to quit. First-year program costs totaled $15,144 for self-help, $25,832 for the contest, and $75,632 for the class. Excluding the developmental costs, these figures were $4,698 for self-help, $17,671 for the contest, and $50,383 for the class. Depending upon assumptions, the cost per quitter was estimated to be $235 to $399 for the class, $129 to $236 for the contest, and $22 to $144 for self-help. Cost-effectiveness ratios were highest for the class (1 year, $399; 5 years, $276), followed by the contest (1 year, $236; 5 years, $151), and the self-help kit (1 year, $144; 5 years, $50).

Reference 26: Cummings, S. R., Rubin, S. M., & Oster, G. O. (1989). The cost-effectiveness of counseling smokers to quit. *Journal of the American Medical Association, 261*(1), 75–79.

Study question: What is the cost-effectiveness of physician counseling against smoking?

Description of study population: Subjects were a hypothetical group of male and female adult smokers seen during routine office visits.

Description of intervention: Four minutes of advice to quit smoking during a routine office visit (one-third of the duration of the office visit) were provided to established patients plus a self-help booklet and a 1-year followup visit devoted entirely to smoking cessation counseling. The cost of the initial counseling intervention was estimated to be $12, including the physician's time ($10) and self-help booklet ($2). The cost of the followup visit was assumed to be $30.

Design: The estimated cost of physician counseling was based on the amount of time that would be spent advising smokers to quit and on the cost of self-help materials. Counseling effectiveness was measured in terms of the difference between the number of patients who would quit smoking if given such advice and the number who would quit smoking on their own. Benefits of intervention were measured in terms of added years of life expectancy experienced by those additional patients who quit smoking. Cost-effectiveness of counseling was expressed in terms of the cost per year of life saved among all smokers counseled, not just those who quit.

Effectiveness of intervention: Based on the results of randomized trials that compared rates of smoking cessation among patients who were given a physician's advice to quit smoking and those who received no counseling, brief advice from a physician was calculated to increase the cessation rate at 1 year by 2.7%. It was assumed that 10% of patients who had abstained for 1 year as a result of physician counseling would relapse and thus gain none of the health benefits of smoking cessation.

Cost impact of intervention: Depending on a patient's age, brief advice and counseling by a physician during a routine office visit about quitting smoking cost from $705 to $988 for men per year of life saved and from $1,204 to $2,058 for women. With regard to the incremental cost-effectiveness of a followup visit about smoking cessation, for men 45 to 49 years of age, cost-effectiveness ratios ranged from $421, assuming a 12-percentage-point increase in the cessation rate, to $5,051, assuming a 1-percentage-point increase.

Reference 27: Fiscella, K., & Franks, P. (1996). Cost-effectiveness of the transdermal nicotine patch as an adjunct to physicians' smoking cessation counseling. *Journal of the American Medical Association, 275*(16), 1247–1251.

Study question: What is the incremental cost-effectiveness of the transdermal nicotine patch?

Description of study population: Subjects were male and female smokers between the ages of 25 and 69 receiving primary care.

Description of intervention: Authors assumed that a physician would offer, in addition to smoking cessation counseling, a prescription for the patch to all patients who smoked, that 50% of those patients would accept the prescription, and that 95% of those patients would use the patch.

Design: This was a decision analytic model that evaluated the incremental cost-effectiveness of the addition of the nicotine patch to smoking cessation counseling by a physician. Costs were based on physician time and the retail cost of the patch; benefits were based on quality-adjusted life years (QALY) saved.

Effectiveness of intervention: The use of the patch produced one additional lifetime quitter at a cost of $7,332. The incremental cost-effectiveness of the nicotine patch by age group ranged from $3,390 to $10,943 per QALY for men and $4,955 to $6,983 per QALY for women. Limiting prescription renewals to patients successfully abstaining for the first 2 weeks improved the cost-effectiveness of the patch by 25%.

Cost impact of intervention: Cost to the payer for a month of therapy with the nicotine patch was estimated to be $111.90 (the average wholesale price plus a 7.5% markup). The cost of additional physician time, based on a rate of $80 per hour, was $6.67.

Reference 28: Green, L. W., Rimer, B., & Bertera, R. (1978). How cost-effective are smoking cessation methods? *World Smoking & Health, 3*(3), 33–40.

Study question: How much would it cost to replicate behavioral methods of smoking cessation on a large scale?

Description of study population: Subjects were participants in 43 studies of smoking cessation that provided sufficient information on methods and results to permit analysis of cost-effectiveness.

Description of intervention: Intervention approaches included drugs (1 study), hypnosis (6 studies), behavior modification (6 studies), education and group support (6 studies), and aversive conditioning (24 studies).

Design: Two analysts experienced in the administration and evaluation of health education programs reviewed the studies and applied consistent rules in estimating costs relative to effects. Cost was defined as dollars expended on the duration and number of contacts with smokers, multiplied by the national average hourly salary or fees of the type of workers used in the study. Effectiveness was defined as the proportionate reduction in smoking as measured by the percentage of participants who remained abstinent at specific points in time following intervention. If contact hours were not specified, they were estimated at 1 hour for individual sessions and 2 hours for group sessions.

Effectiveness of intervention: Comparison of the cost-effectiveness of four types of interventions for which there were sufficient experimental data and description (aversive conditioning, behavior modification, education and group support, and hypnosis) showed the clear disadvantage of hypnosis and the general advantage of group methods, especially when the group focused on developing behavior modification skills, often combined with some form of aversive conditioning. The majority of the most cost-effective studies used a variety of smoking cessation methods, often phased to different points in the cessation process.

Cost impact of intervention: The most cost-effective interventions cost $15 or less per unit of abstinence.

Reference 29: Kemper, D. W. (1982). Self-care education: Impact on HMO costs. *Medical Care, 20*(7), 710–718.

Study question: What is the impact of a medical self-care program on the utilization and cost of in-clinic and referral visits in a prepaid group practice?

Description of study population: Subjects were members of a 6,000-person prepaid group practice health plan in Boise, Idaho, who accepted an invitation to attend a new health education class (48%); 163 individuals completed the demographic questionnaire. Most participants were over age 35, had completed at least 14 years of education and had an average of 2.3 children. Over 70% were female. There were 70 individuals in the experimental group and 93 controls.

Description of intervention: The self-care program consisted of ten 2-hour workshops led by a nurse practitioner. The informal format emphasized skill building and peer reinforcement through demonstrations and discussion. Active workshop participation was encouraged as the key method of developing the confidence to apply the skills and knowledge presented. Participants also received a 250-page self-care guide, *The Healthwise Handbook*, and were assigned readings before each session. Consistency among workshop groups was maintained through the use of an instructor's guide and a series of videotapes supporting the content and concepts of the program.

Design: Plan members who expressed interest in attending the health education class were randomly divided into experimental and control groups. Experimental group members were encouraged to attend the workshop; control group members were asked to complete a questionnaire and were told that although the initial workshops were full, they would be contacted if additional classes were scheduled.

Effectiveness of intervention: One or more members of 26% of the families contacted participated in the workshop, attending an average of 5.5 of the 10 sessions.

Cost impact of intervention: The cost-per-visit analysis showed a $2.54 per-visit difference between experimentals and controls, which was significant at the 0.01 level. An estimated 28% savings in laboratory costs and 24% savings in x-ray costs accounted for 73% of the overall cost per visit margin. The total average savings per participant was $101.27. Excluding program development and research expenditures, the program cost approximately $65 per participating family.

Reference 30: Pelletier, K. R. (1996). A review and analysis of the health and cost-effective outcome studies of comprehensive health promotion and disease prevention programs at the worksite: 1993–1995 update. *American Journal of Health Promotion, 10*(5), 380–388.

Study question: What are the health and cost outcomes of worksite-based comprehensive health promotion and disease prevention?

Description of study population: Subjects were participants in 26 studies previously published in peer-reviewed professional journals. Sample sizes ranged from 80 to 54,902 employees, retirees, or both.

Description of intervention: Interventions included lifestyle management, health risk appraisal, medical self-care books, newsletter, videotapes, behavior change classes, environmental changes, recognition, counseling sessions, television series, social support, monthly mailings, and incentives.

Design: Methods included cross-sectional analysis, random assignment, longitudinal pre- and post-design, time-lagged nonequiva-

lent comparison groups, and quasi-experimental design.

Effectiveness of intervention: Findings included a 4.5% decrease in absenteeism in the intervention by cohort and 3.5% by cross-sectional analysis; declines in doctor visits, hospitalizations, and injuries in the high-intensity intervention group; reductions in risky behavior; 14% decrease in employees who had three or more risk factors; 12% decrease in self-reported illness, and 30% smoking cessation at 2-year followup for program participants.

Cost impact of intervention: Findings included a positive return of $1:$3.4 and a net cumulative benefit of more than $146 million for a $60 million investment projected to accrue over a 15-year period; reduced first-year medical costs of 20% or an average $164 decrease versus a combined increase of $15 in comparison groups, obtained at a cost of $30 per person per year; a net benefit of $161,108 and return on investment of 179%; increased benefit with increased intervention intensity from $145 per person to $421 per person; benefit/cost ratio of $1:$3.6 and annual claim costs in the range of $3.2 to $8 million less than expected.

Reference 31: Smith, G. R., Rost, K., & Kashner, T. M. (1995). A trial of the effect of a standardized psychiatric consultation on health outcomes and costs in somatizing patients. *Archives of General Psychiatry, 52*, 238–243.

Study question: What are the effects and costs of a psychiatric consultation intervention on the management of somatization disorder and medical care costs?

Description of study population: General practitioners, family physicians, and general internists in a seven-county area surrounding Little Rock, AR, were asked by letter to refer patients with a history of multiple unexplained somatic complaints to the study. Volunteers were also recruited through advertisements in local media. Eligibility criteria included having a lifetime history of 6 to 12 unexplained medical symptoms severe enough to cause subjects to take medicine, see a physician, or change their lifestyle. Patients were excluded from the study if they had documented physical disorders that could account for the symptoms or impairment; if they did not have permission to participate from a primary care physician; if they lacked transportation to the medical center; if they planned to move from the area during the course of the study; or if their physicians had participated in one of the investigators' previous studies. Of 151 persons studied by the research team, 56 met participation criteria; all agreed to enroll. The subjects were predominantly female (75%), white (83.9%), currently married (62.5%), and not on Medicare or Medicaid (87.5%), with a mean age of 43.1 years and a mean education of 11.9 years.

Description of intervention: A psychiatric consultation letter was sent to physicians whose patients were assigned to receive the intervention. The letter informed physicians that the patient met criteria for somatization syndrome; described the associated course, morbidity, and mortality; and suggested regularly scheduled brief appointments every 4 to 6 weeks. The letter suggested that a brief physical examination be performed at each visit, focusing on the organ system or body part related to the patient's complaints, and recommended that the physician look for signs of disease. Physicians were encouraged to avoid hospitalization, diagnostic procedures, and surgery and laboratory evalua-

tions unless clearly indicated and to view symptom development as an unconscious process.

Design: In this prospective randomized controlled trial with a one-way crossover from the control condition to the intervention, physicians were randomly assigned to receive the intervention either at the start of the study or 1 year later. Patients of physicians randomized to receive the intervention at 1-year followup comprised the control/crossover group.

Effectiveness of intervention: Of the 56 patients who entered the study, 54 (96%) completed all 4 followup interviews over 2 years. These patients reported significantly better physical functioning during the year after the intervention (P=.002).

Cost impact of intervention: During the year after the intervention, annual medical care charges decreased $289 in 1990 constant dollars, which was calculated to represent a 32.9% reduction in the annual median cost of medical care.

Reference 32: Vickery, D. M., Kalmer, H., Lowry, D., Constantine, M., Wright, E., & Loren, W. (1983). Effect of a self-care education program. *Journal of the American Medical Association, 250*(21), 2952–2956.

Study question: What is the effect of a self-care educational intervention on ambulatory care utilization in an HMO?

Description of study population: All 11,090 households enrolled in the Rhode Island Group Health Association of Providence were invited to participate; at least one adult in 2,833 households (25.5%) accepted. Ultimately, 1,625 households participated in the study. The analysis included only participants who were enrolled for the 6 months prior to and following entry into the study. No demographic information about the participants was provided.

Description of intervention: The intervention consisted of written materials (the reference books *Take Care of Yourself*, and *Taking Care of Your Child* and the monthly newsletter *LifePlan for Your Health*, five brochures on single lifestyle topics, and a self-scored health risk appraisal); a telephone information service staffed by a nurse coordinator and available during regular hours; and an individual health evaluation and planning conference with a trained nurse focusing on issues raised by the self-scored health risk appraisal and program materials. Following the conference, individuals signed a plan to deal with issues discussed; a followup telephone call was made 2 to 6 weeks later.

Design: Households in which at least one adult expressed a willingness to participate were randomized to one of four groups. Group 1 received the mailed written materials and was offered the telephone information service and counseling; group 2 received the mailed written materials and was offered the telephone information service only; group 3 received the written materials only. Group 4 received no intervention during the 1-year study period.

Effectiveness of intervention: Statistically significant decreases in total medical visits (17%) and minor illness visits (35%) were found in each of the experimental groups as compared with the control group.

Cost impact of intervention: Office visits costs were estimated for physicians, nurses, other medical professionals (psychologists, dietitians, and physical therapists), and aides, including personnel costs, supplies, and overhead costs of clinic operations. Intervention costs were incurred in purchas-

ing and delivering materials and services during the last quarter of 1981. It was estimated that the decreases in utilization could result in a savings of approximately $2.50 to $3.50 for each dollar spent on educational interventions.

B. Cost impact not specified

Reference 33: Bien, T. H., Miller, W. R., & Tonigan, J. S. (1993). Brief interventions for alcohol problems: A review. *Addiction, 88*(3), 315–335.

Study question: How effective are relatively brief interventions in reducing alcohol consumption or achieving treatment referral for problem drinkers?

Description of study population: Over 6,000 problem drinkers were enrolled in 44 different studies across 14 countries.

Description of intervention: Interventions in the studies referenced in this article included: counseling by a physician about moderate drinking followed by check-ins monthly with a nurse and quarterly with a physician; 10 minutes of general practitioner advice to reduce alcohol consumption along with feedback from assessment measures and a self-help booklet; 5 minutes of advice; and 15 minutes of counseling and a self-help manual.

Design: This was a review of 12 randomized trials of brief referral or retention procedures and 32 controlled studies of brief interventions targeting drinking behavior.

Effectiveness of intervention: There was encouraging evidence that the course of harmful alcohol use can effectively be altered by well-designed intervention strategies that are feasible within relatively brief contract contexts such as primary health care settings. The six elements commonly included in brief interventions that have been shown to be effective are feedback on personal risk or impairment; emphasis on personal responsibility for change; clear advice to change; a menu of alternative change options; therapeutic empathy as a counseling style; and enhancement of client self-efficacy or optimism.

Cost impact of intervention: Not addressed.

Reference 34: Bottomly, A. (1997). Where are we now? Evaluating two decades of group interventions with adult cancer patients. *Journal of Psychiatric and Mental Health Nursing*, 4(4), 251–265.

Study question: Do group interventions with adult cancer patients reduce the psychological distress associated with cancer and provide other mental health benefits?

Description of study population: The author reviewed 27 studies of male and female adult cancer patients participating in supportive or structured psychoeducational group interventions.

Description of intervention: (1) Supportive group interventions gave patients the opportunity to acknowledge their experiences and express their emotions to other patients. (2) Highly structured psychoeducational group interventions focused on cognitive and behavioral techniques to allow improvements in patients' adaptation to the disease and cancer situation.

Design: Studies consisted of small, nonrandomized samples; nonintervention control groups; and control groups receiving alternative interventions to randomized studies. There was considerable variation in intervention frequency and duration. The interval from intervention to followup ranged from none to 24 months. Study size ranged from 6 to 157 subjects.

Effectiveness of intervention: Various group interventions with cancer patients may offer some mental health benefits in any stage of diagnosis or treatment. Some evidence suggests that structured interventions may offer more benefits than those of a purely supportive nature.

Cost impact of intervention: Not addressed.

Reference 35: Devine, E. C.,& Cook, T. D. (1983). A meta-analytic analysis of effects of psychoeducational interventions on length of postsurgical hospital stay. *Nursing Research, 32*(5), 267–274.

Study question: Do brief psychoeducational interventions affect length of postsurgical hospitalization?

Description of study population: Subjects were adult surgical patients at major medical centers, Department of Veterans Affairs hospitals, HMO-affiliated hospitals, and community hospitals with and without religious affiliations in 49 studies published between 1964 and 1982.

Description of intervention: Interventions consisted of one, two, or all of the following: (1) information about what procedures, pain, and sensations to expect; (2) skills or exercise training to promote recovery by preventing complications or by reducing anxiety; (3) psychosocial support with a health care provider to reduce anxiety or enhance the ability of patients to cope with hospitalization. Most interventions involved face-to-face interactions, though printed and taped materials were also used in some studies.

Design: Thirty-seven studies used experimental designs with random assignment of subjects; 12 utilized quasi-experimental designs.

Effectiveness of intervention: Interventions reduced hospital stays by about 1¼ days.

Cost impact of intervention: Not addressed.

Reference 36: Devine, E. C., O'Connor, F. W., Cook, T. D., Wenk, V. A., & Curtin, T.R. (1988). Clinical and financial effects of psychoeducational care provided by staff nurses to adult surgical patients in the post-DRG environment. *American Journal of Public Health, 78*(10), 1293–1297.

Study question: What are the effects of a workshop for staff nurses on providing patient education and psychosocial support on patient welfare and recovery?

Description of study population: Subjects were 354 adults (64.8% of those eligible) and elective surgical patients ranging in age from 18 to 90 years in teaching hospitals near a large Midwestern city.

Description of intervention: Registered nurses on the experimental units attended a two-stage, 3-hour workshop. The first session included information about past research findings on the effects of psychoeducational care; the results of preworkshop data collection from patients about the extent to which nurses were already incorporating research-based interventions into their clinical practice; and a videotape modeling comprehensive psychoeducational care. The second session focused on strategies to increase levels of psychoeducational care provided.

Design: This was a posttest-only institutional cyclic cohort design with nonequivalent control group.

Effectiveness of intervention: Experimental subjects used fewer sedatives or antiemetics and fewer hypnotics and were discharged from the hospital, on average, half a day sooner.

Cost impact of intervention: Not addressed.

Reference 37: Devine, E. C., & Reifschneider, E. (1995). A meta-analysis of the effects of psychoeducational care in adults with hypertension. *Nursing Research, 44*(4), 237–245.

Study question: What are the effects of psychoeducational care on blood pressure, knowledge about hypertension, medication compliance, weight, compliance with health care appointments, and anxiety?

Description of study population: Subjects were adults with hypertension participating in 88 studies published between 1965 and 1993 in journals or as doctoral dissertations or master's theses.

Description of intervention: The intervention included one or all of the following: teaching (structured or self-directed didactic content on hypertension); behavioral interventions (self-monitoring of medications, blood pressure, or relaxation); or psychosocial support (focused on subjects' feelings about and support for hypertension-related lifestyle changes).

Design: Designs included experimental, quasi-experimental, or pre- or post-single group with at least five subjects in each treatment group.

Effectiveness of intervention: Statistically significant large treatment effects were obtained on knowledge, medical compliance and compliance with health care appointments.

Cost impact of intervention: Not addressed.

Reference 38: Egbert, L. D., Battit, G. E., Welch, C. E., & Bartlett, M. K. (1964). Reduction of postoperative pain by encouragement and instruction of patients. *New England Journal of Medicine, 270*(16), 825–827.

Study question: What are the effects of instruction, suggestion, and encouragement upon the severity of postoperative pain?

Description of study population: Subjects were 97 patients who had undergone elective intra-abdominal operations.

Description of intervention: The night before surgery, the anesthetist visiting patients in the "special care" group informed them about postoperative pain, what would be done about the pain, and what they could do for themselves. The anesthetist also visited patients in this group the afternoon after the operation to reiterate the prior evening's teaching, to listen to their breathing, and to encourage them to take a deep breath and relax. These visits were continued once or twice a day until patients had no further need for narcotics.

Design: Patients were randomly assigned to the "special care" group or control group. Surgeons, surgical residents, and ward nurses involved in ordering and administering narcotics did not know which patients were in which group.

Effectiveness of intervention: A comparison of narcotic requirements found that, while there was no statistically significant difference between the two groups on the day of the operation, for the next 5 days, patients in the special care group requested fewer narcotics ($P<.01$). In that group, narcotic requirements were reduced by half. Patients who were encouraged during the immediate postoperative period by their anesthetists were considered by their surgeons to be ready for discharge from the hospital 2.7 days before the control patients.

Cost impact of intervention: Not addressed.

Reference 39: Fleming, M. F., Barry, K. L., Manwell, L .B., Johnson, K., & London, R. (1997). Brief physician advice for problem alcohol drinkers. *Journal of the American Medical Association*, 277(13), 1039–1045.

Study question: What is the efficacy of brief physician advice in reducing alcohol use and health care utilization in problem drinkers?

Description of study population: A total of 17,695 patients of 64 physicians in 17 community-based primary care practices located in 10 Wisconsin counties were screened for problem drinking. Of those, 2,450 patients screened positive: 1,705 of them completed the interview, and 16.6% met current criteria for alcohol dependence. Study inclusion criteria (men who drank more than 14 drinks per week, women who drank more than 11 drinks per week, excluding those who were pregnant, were under age 18 or over age 65, had participated in alcohol treatment in the previous year, reported symptoms of alcohol withdrawal in the previous year, had been advised by physicians in the previous 3 months to change their alcohol use, drank more than 50 drinks per week or reported symptoms of suicide) were met by 774 of those patients: 482 men and 292 women. Of the 774 patients, 723 (95%) participated in 12-month followup procedures. All adult patients aged 18 to 65 were asked by reception personnel to complete a health screening survey as they arrived for their regularly scheduled physician appointments. Overall response rate was 87%, with a clinic-specific refusal rate ranging from 2% to 30%. Participants were paid $50 if they completed the required procedures.

Description of intervention: During Project TrEAT (Trial for Early Alcohol Treatment), physicians delivered two 10- to 15-minute counseling interventions 1 month apart using a scripted workbook. The workbook contained feedback regarding current health behaviors, a review of the prevalence of problem drinking, a list of the adverse effects of alcohol, a worksheet on drinking cues, a drinking agreement in the form of a prescription, and drinking diary cards. Each patient in the experimental group received a followup telephone call from the clinic nurse 2 weeks after each meeting with a physician. Subjects in the control group received a booklet on general health issues and were followed up at 6 and 12 months through a telephone interview conducted by a researcher. Family members were contacted at 12 months to corroborate patient self-reports. Medical record reviews were conducted after the followup interviews were completed. Participating physicians were trained in family medicine or internal medicine; practiced medicine at least 50% of the time; were based in a community primary care clinic outside a university or Department of Veterans Affairs medical center; and were amenable to participating in a training program and to following the research protocol. They were trained at each clinic to administer the intervention protocol through role-playing and general skills techniques. Physicians or their practices were paid $300 for their participation.

Design: Patients who met inclusion criteria were randomized into an experimental (N=392) and a control (N=382) group.

Effectiveness of intervention: At the 1-year followup, there were significant reductions in 7-day alcohol use, episodes of binge drinking, and frequency of excessive drinking. The greatest reduction in alcohol consumption over time occurred among women in the

experimental group; after 1 year, men showed a 14% reduction of alcohol use, while women showed a 31% reduction. Men in the control group experienced substantially longer hospitalizations during the study period than those in the experimental group.

Cost impact of intervention: Not addressed.

Reference 40: Fries, J. F., Fries, S. T., Parcell, C. L., & Harrington, H. (1992). Health risk changes with a low-cost individualized health promotion program: Effects at up to 30 months. *American Journal of Health Promotion, 6*(5), 364–371.

Study question: What is the impact of a low-cost, mail-focused health promotion program?

Description of study population: All subjects were enrolled in Healthtrac from January 1, 1986, through January 1, 1991, including 135,093 persons under age 65 and 129,982 persons over age 65, with emphasis on the 103,937 for whom followup data were available. Subjects were invited by either their employers or their health insurers to participate. Six-month followup data were available for 45,186 subjects under age 65 and for 58,721 subjects over age 65. One year followup data were available on 21,075 regular program subjects and 36,132 senior subjects; 2-year data on 4,611 and 8,460 subjects; and 30-month data on 1,193 and 5,310 subjects, respectively. Decreasing numbers over longer periods were due to recent program enrollment, loss of insurance coverage, loss of sponsorship, or death. Of eligible individuals, approximately 70% of those initially enrolled in the program continued to participate beyond the first year, and approximately 505 remained in the program at 30 months.

Description of intervention: Included in both the Healthtrac and Senior Healthtrac interventions were health habit questionnaires administered at 6-month intervals; computer-based serial personal health risk reports provided each 6 months; and individualized recommendation letters, newsletters, self-management and health promotion books; and other program materials. One- to three-page personal recommendation letters, signed by a physician, indicated the participants' special health risk problems and provided recommendations on how to correct them. Subsequent reports and letters were based on individual change scores over time. Two books were provided: *Take Care of Yourself,* for all participants under age 65, and *Aging Well,* for senior participants. Program recommendations and prose presentation were adjusted according to participants' educational level and age.

Design: This was a prospective, longitudinal, observational study with a concurrent comparison group.

Effectiveness of intervention: Strong overall positive effects were observed, with improvement in computer health risk scores over 18 months of 14.7% ($P<.0001$) in those 65 and over and 18.4% ($P<.0001$) in those under 65. At 30 months, improvement was 18.8% ($P<.0001$) and 25.7% ($P<.0001$), respectively. Self-report scores improved for all targeted health risk behaviors except for pounds over ideal weight, including smoking, dietary fat, salt and fiber, alcohol, exercise, cholesterol, and reported stress. Each 6-month period saw progressive improvement of about 5%, with consistent results over different age groups and educational levels.

Cost impact of intervention: The cost of the program, which was provided free of charge to participants, was estimated to be

about $30 per person per year. The cost impact of the intervention was not addressed.

Reference 41: Goldberg, I. D., Allen, G., Kessler, L., Carey, J., Locke, B., & Cook, W. A. (1981). Utilization of medical services after short-term psychiatric therapy in a prepaid health plan setting. *Medical Care, 19*(6), 672–686.

Study question: What is the impact of short-term psychiatric therapy on utilization of outpatient medical services? Is there a reduction in the utilization of general medical services that partly offsets the cost of psychiatric care?

Description of study population: The study included 483 "index cases" of key individuals, 483 matched controls, 550 family member "index cases," and 263 matched family member controls in a comprehensive prepaid group practice program composed primarily of federal government employees in the Washington, DC, area. The key individuals were referred in 1970 for short-term psychiatric therapy; up to 16 visits per year were covered as a plan benefit. Key individuals were 65% female and over 50% white. To be included in the study, individuals had to be at least 6 years old on the day of referral; be enrolled in the plan for the 12 months before referral and for the ensuing 16 months; have had no psychotherapy and no referral for psychotherapy in the previous 12 months; be the first family member to be referred to psychiatry during the selection period; and be authorized by the screening psychiatrist to receive short-term psychotherapy.

Description of intervention: Of the 483 index cases, 270 sought short-term psychotherapy from a psychiatrist or other registered psychotherapist on an approved list of community practitioners.

Design: Index cases were compared with matched controls. The study period encompassed the 12 months prior to referral to psychiatry for evaluation, a 4-month period following the referral that was considered the most likely interval in which therapy would occur and the 12 months afterward. Plan personnel abstracted the following data from medical records: medical visits, medical illness and (for index cases) psychiatric data.

Effectiveness of intervention: Compared with controls, index cases decreased days of medical hospitalization significantly. When divided into low and high users of psychiatric therapy, there was a significant difference in medical visits, which declined among low users and increased among high users. The before-after change in utilization among other family members was similar to that for index and control subjects. Index cases did not show a significant reduction of "offset" in utilization of outpatient medical services after referral compared with controls.

Cost impact of intervention: While no cost data are presented, the authors suggest that the offset effect might be maximized by developing tailored programs to satisfy different needs in an efficient and effective manner.

Reference 42: Heather, N., Campion, P. D., Neville, R. G., & Maccabe, D. (1987). Evaluation of a controlled drinking minimal intervention for problem drinkers in general practice (the DRAMS Scheme). *Journal of the Royal College of General Practitioners, 37*, 358–363.

Study question: What is the effectiveness of a controlled drinking, minimal intervention for problem drinkers (the DRAMS

scheme—drinking reasonably and moderately with self-control) compared with simple advice and no intervention?

Description of study population: Sixteen general practitioner principals from eight urban teaching practices in Scotland screened all patients between the ages of 18 and 65 between March and December 1985. Patients who reported consumption of more than 35 units per week for men and 20 units per week for women were eligible. Excluded were those with evidence of late dependence, with known liver disease or severe mental illness, who were receiving antidepressant medication, who were of subnormal intelligence, who were pregnant, or who were dependent on opiate drugs. In the group of 104 patients (78 men, 26 women) admitted to the trial, the mean age was 36.4 years.

Description of intervention: The DRAMS kit consisted of a 4-page introductory leaflet for general practitioners; a medical record card for use by the doctor for patient details, results of blood tests, weekly self-monitored alcohol consumption, and a medical questionnaire; a 2-week self-monitoring drinking diary card for use by the patient; and a 59-page self-help book and a pocket-sized and abbreviated version of a self-help manual on controlled drinking. A physician told the advice-only group that drinking could be harmful, but did not recommend precise quantities of consumption and did not arrange followup consultations regarding their alcohol problems. The control group took a blood test and underwent an initial assessment without any reference to treatment or drinking; no followup consultation was arranged.

Design: Of the 104 heavy or problem drinkers in this study, 34 were randomly assigned to the DRAMS scheme, 32 to a group receiving only simple advice, and 38 to a nonintervention control group. followup assessment interviews were conducted 6 months after the initial consultation. Patients identified individuals who knew them well and who could provide an opinion on their progress; collateral interviews were conducted with these individuals at 6 months. followup information was obtained for 85% of the DRAMS group, 94% of the advice-only group, and 84% of the control group, for an overall followup rate of 88%.

Effectiveness of intervention: No significant differences appeared between the groups in reduction in alcohol consumption, but patients in the DRAMS group showed a significantly greater reduction in a logarithmic measure of serum gamma-glutamyl transpeptidase than patients in the advice-only group. For the sample as a whole, significant reductions in alcohol consumption, in the logarithmic measure of serum gamma-glutamyl transpeptidase, and in mean corpuscular volume occurred. In addition, there was significant improvement on a measure of physical health and well-being.

Cost impact of intervention: Not addressed.

Reference 43: Kemper, D. W., Lorig, K., & Mettler, M. (1993). The effectiveness of medical self-care interventions: A focus on self-initiated responses to symptoms. *Patient Education and Counseling, 21*, 29–39.

Study question: How effective are medical self-care interventions in reducing utilization?

Description of study population: Subjects were participants in 15 studies reviewed by the authors: HMO households with and without children, senior citizens, Medicare households, and groups of retirees.

Description of intervention: Interventions included a self-care book; nurse practitioner-

led workshops with accompanying written materials; mailed books, newsletters, brochures, and a self-scored health risk appraisal; telephone information service; individual counseling; lectures and demonstrations; seminars; personalized letters from physicians; access to a self-care center; one-on-one education sessions with physicians; and slide-tape shows.

Design: Designs included randomization, staggered time-series intervention, and pre- and posttesting.

Effectiveness of intervention: Some studies reported decreases in utilization between 7.2% and 24%.

Cost impact of intervention: Not addressed.

Reference 44: Maccoby, N., Farquhar, J. W., Wood, P. D., & Alexander, J. (1977). Reducing the risk of cardiovascular disease: Effects of a community-based campaign on knowledge and behavior. *Journal of Community Health, 3*(2), 100–114.

Study question: What are the effects of a community-based campaign on risk factors for cardiovascular disease?

Description of study population: Subjects were adults between the ages of 35 and 59 living in one of three California towns.

Description of intervention: There were two types of interventions: (1) a multimedia campaign in English and Spanish including about 3 hours of television programs; over 50 television spots; about 100 radio spots; several hours of radio programming; weekly newspaper columns; newspaper advertisements and stories; direct mail materials; and posters in buses, stores, and worksites; and (2) an intensive-instruction program administered by behavioral scientists and dietitians, most of whom had liberal arts degrees and who received training in counseling methods over a 4-week period. Derived from social learning theory, this behavior modification intervention followed five general steps: analysis of the participants' behavior; modeling of the new behaviors; guided practice in the new behaviors; artificial reinforcement in the new behaviors from instructions; and maintenance of the new habits without artificial reinforcement. Participants received instructions specific to their own particular risk factors.

Design: This was a quasi-experimental approach on a small number of experimental units: one received the mass media intervention only, one received the mass media combined with the intensive instruction and the third served as a control.

Effectiveness of intervention: The community that received intensive instruction showed a substantial reduction in the mean number of cigarettes smoked per day compared with the nonintervention town. Overall, the intensive-instruction intervention when combined with the mass-media campaign emerged as the most effective for participants initially evaluated to be high risk.

Cost impact of intervention: Not addressed.

Reference 45: Morisky, D. E., Levine, D. M., Green, L. W., Shapiro, S., Russell, R. P., & Smith, C. R. (1983). Five-year blood pressure control and mortality following health education for hypertensive patients. *American Journal of Public Health, 73*(2), 153–162.

Study question: What are the long-term effects of a health education program on weight control, appointment keeping behavior, blood pressure control, and mortality?

Description of study population: Subjects were adults with hypertension from various

randomized educational experiences. The cohort of 400 persons had a mean age of 54.1 years, was 75.5% female and 91.6% black, had 8.2 median years of schooling and had a median 1974 household income of $4,250.

Description of intervention: There were three interventions. The first was a 5- to 10-minute individualized exit interview conducted immediately following the patients' encounter with the medical provider. This counseling session focused on explaining and reinforcing the instructions of the practitioner whom the patient had just seen and adapting the regimen to the patient's individual schedule. The second was a home-based instructional session with an adult whom the patient identified as having the most frequent contact at home, usually a spouse. This session emphasized what household members can do to help the patient adhere to the regimen. The third consisted of three 1-hour group sessions led by a social worker. These sessions used a broad range of action-related procedures to provide group support and to strengthen the self-confidence of patients through discussions centering on hypertension management and compliance.

Design: A randomized factorial design distributed the patients into experimental and control groups at each of the three phases of the educational program. All 200 patients randomly assigned to the first intervention received it; 160 of the 200 patients randomly assigned to the second intervention received it; and 96 of the 200 patients randomly assigned to the third intervention attended at least one session.

Effectiveness of intervention: A 5-year analysis showed a continuing positive effect on appointment keeping, weight control, and blood pressure control. The all-cause life table mortality rate was 57.3% less for the experimental group compared with the control group ($P<.05$), while the hypertension-related mortality rate was 53.2% less ($P<.01$).

Cost impact of intervention: Not addressed.

Reference 46: Mumford, E., Schlesinger, H. J., & Glass, G. V. (1982). The effects of psychological intervention on recovery from surgery and heart attacks: An analysis of the literature. *American Journal of Public Health*, 72(2), 141–151.

Study question: How does psychological intervention influence health and the use of medical services?

Description of study population: Subjects were primarily adults, though some studies involved children and families.

Description of intervention: Interventions included relaxation techniques; information and emotional support sessions; preoperative teaching; audiotapes; group therapy; films; modified systematic desensitization; puppet therapy and hypnotherapy.

Design: This was a quantitative review of 34 controlled studies.

Effectiveness of intervention: A review of 13 studies that used postsurgical hospital days as outcome indicators showed that on the average psychological intervention reduced hospitalization approximately 2 days below the control group's average of 9.92 days. The effect size for all 210 outcome indicators in the 34 studies averaged +.49; the intervention groups did better than the control groups by about one-half standard deviation.

Cost impact of intervention: Not addressed.

Reference 47: Rippe, J. M., Price, J. M., Hess, S. A., Kline, G., DeMers, K. A., Damitz, S., Kreidieh, I., & Freedson, P. (1998). Improved psychological well-being, quality of life, and health practices in moderately overweight women participating in a 12-week structured weight loss program. *Obesity Research, 6*(3), 208–218.

Study question: What are the effects of a 12-week weight loss intervention on psychological well-being, quality of life, and health practices in moderately obese women?

Description of study population: Subjects were recruited from the central Massachusetts area through newspaper advertisements and fliers posted in public areas. Women who had participated in a weight loss or exercise program during the previous 3 months; who reported orthopedic or cardiovascular problems that would prevent participation in an exercise program; who were undergoing psychological counseling or taking any psychotropic medications or medications known to affect heart rate response to exercise; and who were pregnant or lactating were excluded from the study. The 80 women enrolled in the study were between the ages of 20 and 49 and weighed between 20% and 50% more than the 1983 Metropolitan Life Insurance Table of desirable weight for height.

Description of intervention: The experimental group participated in a 12-week, nationally available weight loss program (Weight Watchers International), including a self-selected, hypocaloric diet and weekly meetings for group support during which food diaries were reviewed, exercise was discussed, and encouragement was given to subjects experiencing difficulties.

Design: This was a single-center, randomized prospective trial in which enrolled women were randomly assigned to either an intervention or control group. Individuals in the control group were asked to maintain their current nutritional practices and physical activity patterns.

Effectiveness of intervention: The intervention group lost significant body weight compared with controls ($P<.001$). Quality of life indices that also improved significantly in the intervention group compared with controls ($P<.01$) included physical function, vitality, and mental health. Physical activity levels also improved significantly.

Cost impact of intervention: Not addressed.

Reference 48: Schneider, R. H., Staggers, F., Alexander, C. N., Sheppard, W., Rainforth, M., Kondwani, K., Smith, S., & King, C. G. (1995). A randomized controlled trial of stress reduction for hypertension in older African Americans. *Hypertension, 26*(5), 820–827.

Study question: How effective are two stress reduction approaches to the treatment of mild hypertension in older African Americans?

Description of study population: The target population was African-American men and women 55 years of age or older with a history of mild hypertension (90 to 109 mm Hg diastolic blood pressure and less than or equal to 189 mm Hg systolic blood pressure based on three successive measurements at the initial screening visit), whether or not they were taking antihypertensive medication. Candidates were excluded if they had medical evidence of life-threatening or disabling diseases or if their blood pressure exceeded 104 mm Hg diastolic or 179 mm Hg systolic at any two successive visits. Subjects were recruited from local community clinics, senior citizen centers and other

community organizations in Oakland, CA. Over an 18-month period, 213 people were screened for eligibility; 127 were randomized to treatment. After attrition, 111 individuals completed the study.

Description of intervention: The interventions focused on two approaches to stress reduction: transcendental meditation (TM) and progressive muscle relaxation (PMR). Subjects in both groups attended a 1½-hour instructional meeting followed by one same-length session every month for 3 months. Instructors were African Americans who were professionally qualified and experienced in teaching TM or PMR. Participants were instructed to practice their respective techniques every morning and evening for 20 minutes while seated comfortably with their eyes closed. There was also a partial attention lifestyle modification education control group in which subjects received a set of educational instructions and materials modeled after the usual community practice recommendations (dietary sodium and caloric intake reduction plus aerobic exercise) for the nondrug management of mild hypertension. These subjects met in individual or group sessions with a treatment provider once per month for ½ to 1 hour during the treatment period.

Design: This randomized, controlled, single-blind trial based in a primary care center included three study groups to which eligible participants were randomly assigned for the 3-month intervention.

Effectiveness of intervention: After adjustment for significant baseline differences and compared with control, TM reduced systolic pressure by 10.7 mm Hg (P<.0003) and diastolic pressure by 6.4 mm Hg (P<.00005). PMR lowered systolic pressure by 4.7 mm Hg (P=.054) and diastolic pressure by 3.3 mm Hg (P<.02). The reductions in the TM group were significantly greater than in the PMR group for both systolic blood pressure (P=.03) and diastolic blood pressure (P=.03).

Cost impact of intervention: Not addressed.

Reference 49: Shipley, R. H., Orleans, C. T., Wilbur, C. S., Piserchia, M. S., & McFadden, D. W. (1988). Effect of the Johnson & Johnson LIVE FOR LIFE program on employee smoking. *Preventive Medicine, 17*, 25–34.

Study question: How effective is a worksite-based smoking cessation program?

Description of study population: The LIVE FOR LIFE wellness program was offered to four Johnson & Johnson companies, and annual health screens only were offered to three comparison companies within a 50-mile radius of central New Jersey and northern Pennsylvania. Approximately 75% of employees at these companies voluntarily completed a health screen at baseline. Data on smoking status at baseline and a year 2 assessment were provided by 1,399 continuously employed individuals at the LIVE FOR LIFE companies and 748 continuously employed individuals at health screen-only companies—95.2% of the LIVE FOR LIFE employees and 94.3% of the health screen-only employees who provided baseline smoking status. More than half of the smokers were female; their mean age was 34 years.

Description of intervention: Smokers at LIVE FOR LIFE companies were exposed to an environment supportive of healthful lifestyles, including nonsmoking. Following the health screen, they were invited to participate in a 3-hour lifestyle seminar at which they were given the opportunity to partici-

pate on their own time in regularly scheduled programs, one of which was a multicomponent behavioral quit-smoking clinic. This clinic had three phases: preparation for quitting (four sessions), quitting (five sessions), and maintenance (five sessions). Employees quit "cold turkey" with the aid of a safe, aversive-smoking procedure, no-smoking contracts, group support, and carbon monoxide feedback. Health professionals following a standardized format with detailed leader and participant manuals led the groups. Of the 381 baseline smokers at LIVE FOR LIFE companies, 79 (20.7%) participated in a clinic: 29.4% of heavy smokers, 20.6% of moderate smokers, and 10.9% of light smokers. The cost of providing the LIVE FOR LIFE program was $150 to $175 per employee per year. The health screen-only participants received the same health screen used in the LIVE FOR LIFE companies with strong emphasis on health education and the importance of not smoking. An information session was offered to answer health questions an employee might have concerning health screen results.

Design: This study used a quasi-experimental design. When assigning companies to treatment conditions, an attempt was made to achieve a rough balance in employee demographics. To determine whether health screen volunteers and nonvolunteers had similar characteristics, a 53% random sample of all nonvolunteers was selected for a personal interview, which was completed by 65% of this sample. Smoking status was assessed by self-report and serum thiocyanate at baseline and at a 2-year followup.

Effectiveness of intervention: At the LIVE FOR LIFE companies, 22.6% of smokers quit versus 17.4% of smokers at the health screen only companies during the 2-year study period, with a mean abstinence duration of 14.8 months. Among smokers at high risk for coronary heart disease, 32% quit at the LIVE FOR LIFE companies versus 12.9% at the health screen only companies. Employees who participated in a LIVE FOR LIFE smoking cessation clinic had a 31.6% quit rate at the 2-year followup versus 20.2% abstinence among LIVE FOR LIFE baseline smokers who did not attend a clinic.

Cost impact of intervention: Not addressed.

Reference 50: World Health Organization Brief Intervention Group (1996). A cross-national trial of brief interventions with heavy drinkers. *American Journal of Public Health, 86*(7), 948–955.

Study question: What are the relative effects of simple advice and brief counseling with heavy drinkers?

Description of study population: Participants were drawn from hospital wards, emergency departments, primary care clinics, a teachers college, and a health screening agency in eight collaborating centers in Sydney, Australia (273 men, 124 women); Nairobi, Kenya (174 men, 26 women); Mexico City, Mexico (196 men); Bergen, Norway (37 men, 15 women); Cardiff, Wales (164 men); Moscow, Russia (156 men); Farmington, CT (152 men, 113 women); and Harare, Zimbabwe (119 men, 10 women). Of the 1,559 eligible patients initially recruited, 75% were successfully interviewed for the followup evaluation an average of 9 months after assignment. The average age of the male sample was 36.9 years.

Description of intervention: The control group received only a 20-minute health interview and followup. The simple advice group

received the same interview plus 5 minutes of advice about the importance of sensible drinking or abstinence and an illustrated pamphlet that reviewed the alcohol content of local drinks and provided guidance about whether to choose total abstinence or a low-risk drinking goal, with a focus on "sensible drinking limits." They were told that they seemed to be drinking too much, and problems they had described in the interview that could be drinking-related were mentioned. The brief counseling group was given the same health interview and pamphlet, but they also received 15 minutes of counseling about drinking based on a 30-page illustrated problem-solving manual that described the benefits of moderate drinking or abstinence, ways to cope with high-risk drinking situations, and constructive alternatives to drinking. Interviews and interventions were provided to 76.1% of patients by female health advisors. Most of the patients saw health advisors who were nurses (46.3%). Doctors (17.7%), psychologists (17.3%), and other professionals (18.7%) saw the rest.

Design: This was a randomized clinical trial. Eligible patients were randomized to the brief counseling group, the simple advice group or the control group.

Effectiveness of intervention: The intervention groups had significantly greater reductions in drinking than the control group ($P<.05$). At followup, results were significant ($P<.001$) with regard to both average daily consumption and intensity of drinking. The control group reduced its typical daily consumption by approximately 7%, while patients in the simple-advice and brief-counseling groups reported 27% and 21% less drinking respectively. Male patients in the intervention groups reported approximately 17% lower average daily consumption than those in the control group; intensity of drinking was reduced by approximately 10%. Among women, significant reductions were observed in both the control and intervention groups. Five minutes of simple advice were as effective as 20 minutes of brief counseling.

Cost impact of intervention: Not addressed.

VII. Studies of adults age 65 and over

A. Cost impact specified

Reference 51: Leigh, J. P., Richardson, N., Beck, R., Kerr, C., Harrington, H., Parcell, C. L., & Fries, J. F. (1992). Randomized controlled study of a retiree health promotion program. *Archives of Internal Medicine, 152*, 1201–1206.

Study question: What is the impact of a worksite health promotion intervention on health status?

Description of study population: The experimental group was composed of 919 Bank of America retirees; there were 867 in the control group. The average age of subjects was over 68 years; over half were female; educational level averaged 13 years. Subjects were recruited from 33 Retiree Clubs in California representing 5,696 Bank of America retirees. Study participation was offered to 1,887 individuals in the experimental group and to 1,892 individuals in the questionnaire-only group. There were 1,907 individuals in the unobtrusive control group. In the experimental group, 1,089 individuals responded initially, 999 participated at 6 months and 919 were still involved at 1 year (46%).

Description of intervention: The experimental group participated in the Senior

Healthtrac Program consisting of lifestyle questionnaires administered at 6-month intervals, serial personal health risk reports, individualized physician-signed recommendation letters, a set of nutrition tips provided at 6 months, quarterly newsletters, and a self-management book distributed in the first month. Subsequent reports and recommendation letters sent to participants were based on change scores over time.

Design: The 33 Retiree Clubs were divided into 11 groups of 3, matched according to similar geographic location, urban versus rural, and club size. Each set of matched clubs was randomly allocated to one of three study groups. Group 1, the intervention or experimental group, received the full program. Group 2, the questionnaire-only control group, completed identical questionnaires at 1, 6, and 12 months but did not receive the intervention. Group 3 subjects were not informed about the program and were monitored for insurance claims experience only.

Effectiveness of intervention: Health habit and health status changes averaged 6%–14% and were highly statistically significant in those who voluntarily entered the program. The strongest statistically significant levels were achieved for the summary variables overall health risk (P=.0001), sick days (P=.0005), and cheese consumption (P=.0007). The intervention appeared to exert a larger effect on hospital days than physician visits.

Cost impact of intervention: Participants in the full program group experienced, on average, $123.20 fewer indirect costs per year than did those in the questionnaire-only group. Estimated direct costs, based conservatively on average costs of $65 for a physician visit and $750 per day for hospitalization, decreased by 22% in the experimental group and increased by 12% in the questionnaire-only group. The reported estimated direct costs for each of the subjects receiving the full program were approximately $142, representing a savings of approximately $130,498. The cost of the program, marketed nationally at $30 per participant per year, was $27,570 for participants in the full program group. The benefit-cost ratio indicated that for every dollar expended on the program, roughly $5 were saved in direct costs. Per-person claims paid decreased by $74 from baseline in the full program group and increased by $266 in the combined control groups, for a difference of $340. The self-report estimates, including only direct costs for physician visits and hospital days, but accounting for deductibles, coinsurance and noncovered services, suggested cost savings of $165 per year for the full program group compared with the questionnaire-only group.

Reference 52: Vickery, D. M., Golaszewski, T. J., Wright, E. C., & Kalmer, H. (1988). The effect of self-care interventions on the use of medical service within a Medicare population. *Medical Care, 26*(6), 580–588.

Study question: What are the effects of a self-care communication-based health education program on ambulatory care utilization?

Description of study population: The 30,000 members of the Rhode Island Group Health Association of Providence provided the population for this study. There were 1,009 Medicare-enrolled families with 1,249 eligible individuals; 560 households were assigned to the experimental group, and 449 to the control group. Only nine eligible individuals refused participation.

Description of intervention: Experimental group households received letters that

explained the purpose of the research and intervention process. During the intervention, these households also received two reference books (*Take Care of Yourself* and *Life Plan for Your Health*), a monthly newsletter, eight brochures on lifestyle topics and self-help groups, and four newsletters and two self-care education packages designed specifically for those over age 60. All materials emphasized individual decisions in the areas of self-care, medical care, utilization and lifestyle. In addition, a nurse coordinator staffed a telephone information service during regular hours, offering information on the program, assistance in using the intervention, and information on health and medical topics.

Design: Potential subjects were randomly assigned to an experimental or control group. In cases where individuals in the same household were assigned to different groups, all were reassigned to the experimental group.

Effectiveness of intervention: A statistically significant decrease of 15% in total medical visits was found in the experimental group as compared with controls.

Cost impact of intervention: Medical visit decreases resulted in a savings of $36.65 per household in the experimental group for a benefit-cost ratio of $2.19 saved for every dollar spent on intervention.

B. Cost impact not specified

Reference 53: Fleming, M. F., Manwell, L. B., Barry, K. L., Adams, W., & Stauffacher, E. A. (1999). Brief physician advice for alcohol problems in older adults: A randomized community-based trial. *The Journal of Family Practice, 48*(5), 378–384.

Study question: What is the efficacy of brief physician advice in reducing alcohol use and health care utilization among older adult problem drinkers?

Description of study population: The participant group was drawn from 43 physicians in 24 clinics in rural and urban areas of south central and southeastern Wisconsin. Clinic sites ranged from solo practices to large managed care organizations. Physicians were paid $250 for their participation in the study. The 6,693 individuals aged 65 and older who had regularly scheduled appointments between April 1, 1993, and April 1, 1995, were asked to complete a health screening survey. Of the 6,073 individuals who did so, 656 had a positive result for problem drinking and were invited to participate in a face-to-face research interview, which was completed by 396 persons. To be eligible for this study, individuals had to meet at least one of the following criteria: men consuming more than 11 drinks per week or women consuming more than 8 drinks per week; 2 or more positive responses to the Cutting down, Annoyance by criticism, Guilty-feeling, and Eye-openers (CAGE) questionnaire; or binge drinking. Excluded were individuals who had attended an alcohol treatment program; who reported symptoms of alcohol withdrawal in the previous year; who received physician advice within the prior 3 months to change their alcohol use; who drank more than 50 drinks per week; or who reported thoughts of suicide. A total of 158 subjects were determined eligible. Individuals were paid $70 to complete required study procedures. The sample included 105 men and 53 women, most in the 65 to 75 age range. Approximately 75% were married or living with a partner; most of the other subjects were widows or widowers. Almost 20% of women and 50% of men had completed 4 or more years of college.

Description of intervention: Individuals in the intervention group were given a general health booklet and an appointment with their personal physicians, during which they received a workbook containing feedback on their health behaviors, a review of problem-drinking prevalence, reasons for drinking, adverse effects of alcohol, drinking cues, a drinking agreement in the form of a prescription, and drinking diary cards. Two 10- to 15-minute intervention and reinforcement visits with the physician were scheduled 1 month apart. The clinic nurse also made a followup call to each individual 2 weeks after each visit.

Design: Eligible men and women were randomized separately into the intervention group (N=87) or control group (N=71). Those in the control group received the same general health booklet as those in the intervention group. All study subjects were followed up by telephone at 3, 6 and 12 months. The followup rate was 92.4% at 12 months. Family members were also contacted at 12 months to corroborate the self-reports of study subjects. Although all physicians had both intervention and control group patients, neither they nor their staff members were told which of their patients were randomized to the control group.

Effectiveness of intervention: At 3-month followup, weekly alcohol use decreased 40% in the intervention group compared with 6% in the control group. At 12 months, the intervention group's baseline weekly alcohol consumption had dropped by 36%, or about five fewer drinks per week. In the control group, weekly alcohol use had been reduced by less than one drink per week between baseline and 12-month followup; this difference was statistically significant (P<.001). The proportion of individuals in the intervention group classified as excessive drinkers decreased by 52% at the 3-month followup, and levels of binge drinking declined by 47%; these reductions persisted at the 12-month followup. In the control group, average drinks per week decreased slightly over time, but levels of excessive drinking and binge drinking increased. Patterns of health care utilization were not extensively analyzed because of the small number of events.

Cost impact of intervention: Not addressed.

Reference 54: German, P. S., Burton, L. C., Shapiro, S., Steinwachs, D.M., Tsuji, I., Paglia, M. J., & Damiano, A. M. (1995). Extended coverage for preventive services for the elderly: Response and results in a demonstration population. *American Journal of Public Health, 85*(3), 379–386.

Study question: What is the acceptability and effect of preventive services under Medicare waivers to a community-dwelling population aged 65 and over?

Description of study population: The authors reviewed Medicare claims by internists, family practitioners, and physicians in general internal medicine and geriatrics; solo practitioners; physicians in group practice; and hospital-based physicians. Those who had visits from 25 or more Medicare beneficiaries age 65 and over during a 1-year period were selected for recruitment. Of the 374 physicians approached for participation, 8 declined and 235 had one or more of their patients enrolled. Ten nurse practitioners or physician's assistants and two doctors of osteopathy also had patients enrolled. The sampling frame for patient recruitment was all Medicare beneficiaries with Part A and Part B coverage residing in

seven zip codes in the eastern third of Baltimore, MD (N=33,800). Approximately 64% of the patients in the initial sample were removed because they had used a service from another Health Care Financing Administration-funded demonstration in the community. The remaining 12,111 were screened. Of the 5,281 who were eligible, 4,459 (84%) completed interviews. Inclusion of an estimate of the number of refusers who would have been eligible resulted in an overall completion rate of 74%. Patients whose physicians withdrew early in the demonstration and patients who were not known to the physician they identified at enrollment were removed, leaving a final adjusted enrollment of 2,105 individuals in the intervention group and 2,090 in the control group. More than half of the subjects were between the ages of 65 and 74, more than 80% were white, more than 60% were female, more than 40% had 8 years of education or fewer, more than 45% were married, more than 80% had a confidant, more than 66% lived with others, about 14% had an income below poverty level, and over 82% had Medigap insurance.

Description of intervention: Participating clinicians were asked to attend one orientation session to review the components of the preventive and counseling visits, to learn how to bill the project for reimbursement, and to receive materials prepared by the state medical society to assist clinicians in counseling their patients on health habits. Materials were mailed to those who did not attend, and the components of the demonstration were explained over the telephone. Within 2 weeks of the baseline survey and enrollment, intervention group subjects received an explanatory letter and a voucher for a visit without charge to their primary caregiver. The service package they received had three components: a physician examination, history and evaluation; laboratory procedures and immunizations; and counseling for health risks. Physicians were asked to review health risks and to provide counseling where appropriate. After this visit, the clinician completed an encounter form indicating procedures performed, health behaviors discussed, lab tests ordered, new problems, referrals for specialty care and whether an additional counseling session was recommended. Vouchers for followup counseling visits were issued only upon the physician's request. The counseling visit was designed to follow up on one or more of 10 areas: smoking, exercise, diet, alcohol use or abuse, emotional distress, injury prevention and falls, medication use and adverse reactions, sleep problems, functional status, and urinary incontinence. Approximately 1 year after the first visit, a voucher for a second preventive visit and a letter were mailed. The same letter was sent to control subjects who had not made a first visit along with the booklet *Strategies for Good Health*, published by the American Association of Retired Persons, which discusses prevention and offers guidance for those desiring further help in obtaining preventive services.

Design: Subjects were randomized into intervention and control groups following the baseline survey. Sociodemographic, utilization, and health risk prevention data were gathered at baseline and followup as well as assessments of general health status and emotional distress.

Effectiveness of intervention: A preventive clinical visit was made by 63% of the intervention group, and about 52% of them returned for a followup counseling visit within 6 months. The second preventive visit

was made by 32%, and 33% returned for the second counseling visit. Characteristics significantly associated with going for preventive visits included having a confidant, being married, being nonwhite, being male, and having more than a grade school education. Patients in solo practices and those with female providers were more likely to make a preventive visit. Over the 2 years, a greater proportion of control patients died (11.1%) than intervention patients (8.3%) (P=.003).

Cost impact of intervention: Although cost data are not presented, the authors report that there were no greater Medicare costs for the intervention group over the 2-year study period despite the additional expense of the preventive and followup visits.

XII. Bibliography

Aktan, G. F., Kumpfer, K. L., & Turner, C. W. (1996). Effectiveness of a family skills training program for substance use prevention with inner city African-American families. *Substance Use & Misuse, 31*(2), 157–175.

Albee, G. W. (1996). Revolutions and counterrevolutions in prevention. *American Psychologist, 51*(11), 1130–1133.

Altman, D. G., Flora, J. A., Fortmann, S. P., & Farquhar, J. W. (1987). The cost-effectiveness of three smoking cessation programs. *American Journal of Public Health, 77*(2), 162–165.

American College of Mental Health Administration. (1997). *The Santa Fe Summit on Behavioral Health: Preserving quality and value in the managed care equation*. Pittsburgh, PA: Author.

Beardslee, W. R., Salt, P., Versage, E. M., Gladstone, T. R. G., Wright, E. J., & Rothberg, P. C. (1997). Sustained change in parents receiving preventive interventions for families with depression. *American Journal of Psychiatry, 154*(4), 510–515.

Beardslee, W. R., Wright, E., Rothberg, P. C., Salt, P., & Versage, E. (1996). Response of families to two preventive intervention strategies: Long-term differences in behavior and attitude change. *Journal of the American Academy of Child and Adolescent Psychiatry, 35*(6), 774–782.

Beardslee, W. R., Wright, E. J., Salt, P., Drezner, K., Gladstone, T. R. G., Versage, E. M., & Rothberg, P. C. (1997). Examination of children's responses to two preventive intervention strategies over time. *Journal of the American Academy of Child and Adolescent Psychiatry, 36*(2), 196–204.

Beaves, R. G., Joseph, H., Rohrer, J. E., & Zeitler, R. R. (1988). Cost-effectiveness: How should it be determined? *Evaluation & the Health Professions, 11*(2), 213–230.

Bero, L. & Rennie, D. (1995). The Cochrane collaboration: Preparing, maintaining, and disseminating systematic reviews of the effects of health care. *Journal of the American Medical Association, 274*(24), 1935–1938.

Bien, T. H., Miller, W. R., & Tonigan, J. S. (1993). Brief interventions for alcohol problems: A review. *Addiction, 88*(3), 315–335.

Bottomly, A. (1997). Where are we now? Evaluating two decades of group interventions with adult cancer patients. *Journal of Psychiatric and Mental Health Nursing, 4*(4), 251–265.

Breslow, L. (1996). Public health and managed care: A California perspective. *Health Affairs, 15*(1), 93–99.

Buck, J. A., Teich, J. L., Umland, B., & Stein, M. (1999). Behavioral health benefits in employer-sponsored health plans. *Health Affairs, 18*(2). 67–78.

Buck, J. A., & Umland, B. (1997). Covering mental health and substance abuse services. *Health Affairs, 16*(4), 120–126.

Center for Mental Health Services. (1996a). *Introduction to managed behavioral health care: Implications for public mental health and substance abuse services.* Rockville, MD: Author.

Center for Mental Health Services. (1996b). *Mental health, United States, 1996.* (DHHS Publication No. SMA 96–3098). Rockville, MD: Author.

Center for Mental Health Services. (1996c). *Prevention and cost analysis: The ABC's of cost Analysis.* Rockville, MD: Author.

Center for Substance Abuse Prevention. (1998a). *A guide for evaluating prevention effectiveness.* Rockville, MD: Author.

Center for Substance Abuse Prevention. (1998b). *Managed care and prevention: Substance abuse resource guide.* (DHHS Publication No. SMA 98–3237). Rockville, MD: Author.

Center for Substance Abuse Prevention. (1997a). *Guidelines and benchmarks for prevention programming.* (DHHS Publication No. SMA 95–3033). Rockville, MD: Author.

Center for Substance Abuse Prevention. (1997b). *Selected findings in prevention: A decade of results from the Center for Substance Abuse Prevention (CSAP).* (DHHS Publication No. SMA 97–3143). Rockville, MD: Author.

Center for Substance Abuse Prevention. (1996). *CSAP-Aetna/US Healthcare Prevention Training Workshop in Managed Behavioral Healthcare: Workshop proceedings.* East Rutherford, NJ: Author.

Center for Substance Abuse Prevention. (1994). *Cost-benefit issues in programs for prevention of alcohol and other drug abuse.* (DHHS Publication No. SMA 94–3009). Rockville, MD: Author.

Centers for Disease Control and Prevention. (1996). *Chronic disease notes & reports.* 9(1), 12, 27.

Clarke, G. N., Hawkins, W., Murphy, M., Sheeber, L. B., Lewinsohn, P. M., & Seeley, J. R. (1995). Targeted prevention of unipolar depressive disorder in an at-risk sample of high school adolescents: A randomized trial of a group cognitive intervention. *Journal of the American Academy of Child and Adolescent Medicine, 34*(3), 312–321.

Clay, R. A. (1997). SAMHSA works to prevent substance abuse through managed care. *SAMHSA News, 5*(4), 6–8.

Cummings, S. R., Rubin, S. M., & Oster, G. O. (1989). The cost-effectiveness of counseling smokers to quit. *Journal of the American Medical Association, 261*(1), 75–79.

Davis, K., Bialek, R., Parkinson, M., Smith, J., & Vellozzi, C. (1990). Paying for preventive care: Moving the debate forward. *American Journal of Preventive Medicine, 6*(4 supplement), 1–29.

Devine, E. C., & Cook, T. D. (1983). A meta-analytic analysis of effects of psychoeducational interventions on length of postsurgical hospital stay. *Nursing Research, 32*(5), 267–274.

Devine, E. C., O'Connor, F. W., Cook, T. D., Wenk, V. A., & Curtin, T. R. (1988). Clinical and financial effects of psychoeducational care provided by staff nurses to adult surgical patients in the post-DRG environment. *American Journal of Public Health, 78*(10), 1293–1297.

Devine, E. C., & Reifschneider, E. (1995). A meta-analysis of the effects of psychoeducational care in adults with hypertension. *Nursing Research, 44*(4), 237–245.

Dupont, R. L., Rice, D. P., Miller, L. S., Shiraki, S. S., Rowland, C. R., & Harwood, H. J. (1996). Economic costs of anxiety disorders. *Anxiety, 2*, 167–172.

Durlak, J. A. (1998). Common risk and protective factors in successful prevention programs. *American Journal of Orthopsychiatry, 68*(4), 512–520.

Durlak, J. A., & Wells, A. M. (1998). Evaluation of indicated preventive intervention (secondary prevention) mental health programs for children and adolescents. *American Journal of Community Psychology, 26*(5), 775–802.

Durlak, J. A., & Wells, A. M. (1997). Primary prevention mental health programs for children and adolescents: A meta-analytic review. *American Journal of Community Psychology, 25*(2), 115–151.

Eakin, E., Severson, H., & Glasgow, R. E. (1989). Development and evaluation of a smokeless tobacco cessation program. *NCI Monographs,* (8), 95–100.

Edmunds, M., Frank, R., Hogan, M., McCarty, D., Robinson-Beale, R., & Weisner, C. (Eds.). (1997). *Managing managed care: Quality improvement in behavioral health (summary).* Washington, DC: Institute of Medicine.

Egbert, L. D., Battit, G. E., Welch, C. E., & Bartlett, M. K. (1964). Reduction of postoperative pain by encouragement and instruction of patients. *New England Journal of Medicine, 270*(16), 825–827.

Emshoff, J. G., & Anyan, L. L. (1991). From prevention to treatment. Issues for school-aged children of alcoholics. *Recent Developments in Alcoholism, 9*, 327–46.

England, M. J. (1999). Perspective: Capturing mental health cost offsets. *Health Affairs, 18*(2), 91–93.

Field, T. (1995). Infants of depressed mothers. *Infant Behavior and Development, 18*, 1–13.

Field, T., Grizzle, N., Scafidi, F., Abrams, S., & Richardson, S. (1996a). Massage therapy for infants of depressed mothers. *Infant Behavior and Development, 19*, 107–112.

Field, T., Grizzle, N., Scafidi, F., & Schanberg, S. (1996b). Massage and relaxation therapies' effects on depressed adolescent mothers. *Adolescence, 31*(124), 903–911.

Field, T. M., Scafidi, F., Pickens, J., Prodromidis, M., Pelaez-Nogueras, M., Torquati, J., Wilcox, H., Malphurs, J., Shanberg, S., & Kuhn, C. (1998). Polydrug-using adolescent mothers and their infants receiving early intervention. *Adolescence, 33*(129), 118–143.

Field, T., Widmayer, S., Greenberg, R., & Stoller, S. (1982). Effects of parent training on teenage mothers and their infants. *Pediatrics, 69*(6), 703–707.

Finney, J. W., Riley, A. W., & Cataldo, M. F. (1991). Psychology in primary health care: Effects of brief targeted therapy on children's medical care utilization. *Journal of Pediatric Psychology, 16*(4), 447–461.

Fiscella, K., & Franks, P. (1996). Cost-effectiveness of the transdermal nicotine patch as an adjunct to physicians' smoking cessation counseling. *Journal of the American Medical Association, 275*(16), 1247–1251.

Fishman, P., VonKorff, M., Lozano, P., & Hecht, J. (1999). Chronic care costs in managed care. *Health Affairs, 16*(3), 239–247.

Fleming, M. F., Barry, K. L., Manwell, L. B., Johnson, K., & London, R. (1997). Brief physician advice for problem alcohol drinkers. *Journal of the American Medical Association, 277*(13), 1039–1045.

Fleming, M. F., Manwell, L. B., Barry, K. L., Adams, W., & Stauffacher, E. A. (1999). Brief physician advice for alcohol problems in older adults: A randomized community-based trial. *The Journal of Family Practice, 48*(5), 378–384.

Frank, R. G., & McGuire, T. G. (1995). Estimating costs of mental health and substance abuse coverage. *Health Affairs, 14*(3), 102–115.

French, M. T., Mauskopf, J. A., Teague, J. L., & Roland, E. J. (1996). Estimating the dollar value of health outcomes from drug-abuse interventions. *Medical Care, 34*(9), 890–910.

Friedman, E. (1998). Prevention, public health and managed care: Obstacles and opportunities. *American Journal of Preventive Medicine, 14*(35), 102–105.

Friedman, R., Sobel, D., Myers, P., Caudill, M., & Benson, H. (1995). Behavioral medicine, clinical health psychology and cost offset. *Health Psychology, 14*(6), 509–518.

Fries, J. F. (1997). Editorial: Can preventive gerontology be on the way? *American Journal of Public Health, 87*(10), 1591–1592.

Fries, J. F., Fries, S. T., Parcell, C. L., & Harrington, H. (1992). Health risk changes with a low-cost individualized health promotion program: Effects at up to 30 months. *American Journal of Health Promotion, 6*(5), 364–371.

Fries, J. F., Green, L. W., & Levine, S. (1989). Health promotion and the compression of morbidity. *The Lancet*, 481–483.

Fries, J. F., Koop, C. E., Sokolov, J., Beadle, C. E., & Wright, D. (1998). Beyond health promotion: Reducing need and demand for medical care. *Health Affairs, 17*(2), 70–84.

Gabel, J. (1997). Ten ways HMOs have changed during the 1990s. *Health Affairs, 16*(3), 134–145.

Gager, P. J., & Elias, M. J. (1997). Implementing prevention programs in high-risk environments: Application of the resiliency paradigm. *American Journal of Orthopsychiatry, 68*(3), 363–373.

German, P. S., Burton, L. C., Shapiro, S., Steinwachs, D. M., Tsuji, I., Paglia, M. J., & Damiano, A. M. (1995). Extended coverage for preventive services for the elderly: Response and results in a demonstration population. *American Journal of Public Health, 85*(3), 379–386.

Gold, M. R., Siegel, J. E., Russell, L. B., & Weinstein, M. C. (Eds.). (1996). *Cost-effectiveness in health and medicine*. New York: Oxford University Press.

Goldberg, I. D., Allen, G., Kessler, L., Carey, J., Locke, B., & Cook, W. A. (1981). Utilization of medical services after short-term psychiatric therapy in a prepaid health plan setting. *Medical Care, 19*(6), 672–686.

Goldman, H. H. (1999). Perspective: Justifying mental health care costs. *Health Affairs, 18*(2), 94–95.

Gordon, R. (1983). An operational classification of disease prevention. *Public Health Reports, 98*, 107–109.

Gorman, D. M. (1992). Using theory and basic research to target primary prevention programs: Recent developments and future prospects. *Alcohol & Alcoholism, 27*(6), 583–594.

Green, L. W., Rimer, B., & Bertera, R. (1978). How cost-effective are smoking cessation methods? *World Smoking & Health, 3*(3), 33–40.

Greenberg, P. E., Stiglin, L. E., Finkelstein, S. N., & Berndt, E. R. (1993). The economic burden of depression in 1990. *Journal of Clinical Psychiatry, 54*(11), 405–418.

Gresenz, C. R., Liu, X., & Sturm, R. (1998). Merged behavioral health services for children under carve-out contracts. *Psychiatric Services, 49*(8), 1054–1058.

Haddix, A. C., Teutsch, S. M., Shaffer, P. A., & Duret, D. O. (Eds). (1996). *Prevention effectiveness: A guide to decision analysis and economic evaluation*. New York: Oxford University Press.

Harris, J. R., Isham, G. J., & Smith, M. (1998). Prevention in managed care: Joining forces for value and quality. *American Journal of Preventive Medicine, 14*(3)(Suppl.), 1–124.

Health Care Financing Administration. (1992). *Report to Congress: Medicaid and institutions for mental diseases.* (HCFA publication #03339). Baltimore, MD: Author.

Health Resources & Services Administration. (1997). *Meeting the challenge: HRSA & managed care.* Rockville, MD: Author.

Heather, N., Campion, P. D., Neville, R. G., & Maccabe, D. (1987). Evaluation of a controlled drinking minimal intervention for problem drinkers in general practice (the Drams Scheme). *Journal of the Royal College of General Practitioners, 37,* 358–363.

Heller, K. (1996). Coming of age of prevention science: Comments on the 1994 National Institute of Mental Health–Institute of Medicine Prevention Reports. *American Psychologist, 51*(11), 1123–1127.

Hyder, A., Rotlant, G., & Morrow, R. H. (1998). Measuring the burden of disease: Healthy life-years. *American Journal of Public Health, 88*(2), 196–202.

Inglehart, J. K. (1996). Managed care and mental health. *The New England Journal of Medicine, 334*(2), 131–135.

Jensen, G. A., Rost, K., Burton, R. P. D., & Bulycheva, M. (1998). Mental health insurance trends in the 1990s: Are employers offering less to more? *Health Affairs, 17*(3), 201–208.

Kemper, D. W. (1982). Self-care education: Impact on HMO costs. *Medical Care, 20*(7), 710–718.

Kemper, D. W., Lorig, K., & Mettler, M. (1993). The effectiveness of medical self-care interventions: A focus on self-initiated responses to symptoms. *Patient Education and Counseling, 21,* 29–39.

Kessler, R. C., & Frank, R. G. (1997). The impact of psychiatric disorders on work loss days. *Psychological Medicine, 27,* 861–873.

Koretz, D. S. (1991). Prevention-centered science in mental health. *American Journal of Community Psychology, 19*(4), 453–458.

Leaf, A. (1989). Cost effectiveness as a criterion for Medicare coverage. *The New England Journal of Medicine, 321*(13), 898–900.

Leigh, J. P., Richardson, N., Beck, R., Kerr, C., Harrington, H., Parcell, C. L., & Fries, J. F. (1992). Randomized controlled study of a retiree health promotion program. *Archives of Internal Medicine, 152,* 1201–1206.

Logsdon, D. N., & Rosen, M. A. (1984). The cost of preventive services in primary medical care and implications for health insurance coverage. *Journal of Ambulatory Care Management, 7*(4), 46–55.

Maccoby, N., Farquhar, J. W., Wood, P. D., & Alexander, J. (1977). Reducing the risk of cardiovascular disease: Effects of a community-based campaign on knowledge and behavior. *Journal of Community Health, 3*(2), 100–114.

Marks, J. S., Koplan, J. P., Hogue, C. J. R., & Dalmat, M. E. (1990). A cost-benefit/cost-effectiveness analysis of smoking cessation for pregnant women. *American Journal of Preventive Medicine, 6*(5), 282–289.

McGinnis, J. M., & Foege, W. H. (1993). Actual causes of death in the United States. *Journal of the American Medical Association, 270*(18), 2207–2212.

McGinnis, J. M., & Lee, P. R. (1995). Healthy People 2000 at mid decade. *Journal of the American Medical Association, 273*(14), 1123–1129.

McKusick, D., Mark, T. L., King, E., Harwood, R., Buck, J. A., Dilonardo, J., & Genuardi, J. S. (1998). Spending for mental health and substance abuse treatment, 1996: The first comprehensive look at nationwide spending trends in this decade. *Health Tracking: Trends,* 147–157.

Members of the Ohio Department of Alcohol and Drug Addiction Services' (ODADAS') Wellness/Health Promotion Work Group. (1995). *Prevention: A cornerstone of managed care (alcohol, tobacco and other drug prevention services position paper).* Columbus, OH: Author.

Morisky, D. E., Levine, D. M., Green, L. W., Shapiro, S., Russell, R. P., & Smith, C. R. (1983). Five-year blood pressure control and mortality following health education for hypertensive patients. *American Journal of Public Health, 73*(2), 153–162.

Moss, N. E., & Carver, K. (1998). The effect of WIC and Medicaid on infant mortality in the United States. *American Journal of Public Health, 88*(9), 1354–1361.

Mrazek, P. J. (1998). *Preventing mental health and substance abuse problems in managed care settings.* Alexandria, VA: National Mental Health Administration.

Mrazek, P. J., & Haggerty, R. J. (Eds.). (1994). *Reducing risks for mental disorders: Frontiers for preventive intervention research.* Washington, DC: National Academy Press.

Muehrer, P., & Koretz, D. S. (1992). Issues in preventive intervention research. *Current Directions in Psychological Science, 1*(3), 1–4.

Mullen, P., & Zapka, J. G. (1982). *Guidelines for health promotion and education services in HMOs.* Washington, DC: U.S. Department of Health and Human Services.

Mullen, P. D., & Zapka, J. G. (1981). Health education and promotion in HMOs: The recent evidence. *Health Education Quarterly, 8*(4), 292–315.

Mumford, E., Schlesinger, H. J., & Glass, G. V. (1982). The effects of psychological intervention on recovery from surgery and heart attacks: An analysis of the literature. *American Journal of Public Health, 72*(2), 141–151.

Munoz, R. F., Mrazek, P. J. & Haggerty, R. J. (1996). Institute of Medicine report on prevention of mental disorders. *American Psychologist, 51*(11), 1116–1122.

Murray, C. J., & Lopez, A. (Eds.). (1996). *The global burden of disease.* Cambridge, MA: Harvard University Press for WHO and the World Bank.

National Center for Chronic Disease Prevention and Health Promotion. (1997). Special focus: Public health and managed care. *Chronic Disease Notes & Reports, 10*(1), 1–37.

National Institute on Drug Abuse. (1998). *Cost-benefit/cost-effectiveness research of drug abuse prevention: Implications for programming and policy.* (NIH Research Monograph 176, NIH Publication #98–4021). Rockville, MD: Author.

National Institute on Drug Abuse. (1997a). *Meta-analysis of drug abuse prevention programs.* (NIDA Research Monograph 170). Rockville, MD: Author.

National Institute on Drug Abuse. (1997b). *Preventing drug use among children and adolescents: A research-based guide.* (NIH Publication No. 97–4212). Rockville, MD: Author.

National Institute of Mental Health. (1998). *Priorities for prevention research at NIMH: A report by the national advisory mental health council.* (NIH Publication No. 98–4321). Bethesda, MD: Author.

National Institute of Mental Health. (1996). *Fifth National Conference on Prevention Research: Conference proceedings.* McLean, VA: Author.

Olds, D. L., Eckenrode, J., Henderson, C. R., Kitzman, H., Powers, J., Cole, R., Sidora, K., Morris, P., Pettitt, L. M., & Luckey, D. (1997). Long-term effects of home visitation on maternal life course and child abuse and neglect. *Journal of the American Medical Association, 278*(8), 637–643.

Olds, D. L., Henderson, C. R., Phelps, C., Kitzman, H., & Hanks, C. (1993). Effect of prenatal and infancy nurse home visitation on government spending. *Medical Care, 31*(2), 155–174.

Olfson, M., Sing, M., & Schlesinger, H. J. (1999). Mental health/medical care cost offsets: Opportunities for managed care. *Health Affairs, 18*(2), 79–90.

Omenn, G. S. (1994). *Prevention: Benefits, costs, & savings.* Washington, DC: Partnership for Prevention.

Orford, J. (1984). The prevention and management of alcohol problems in the family setting: A review of work carried out in English-speaking countries. *Alcohol & Alcoholism, 19*(2), 109–22.

Pelletier, K. R. (1996). A review and analysis of the health and cost-effective outcome studies of comprehensive health promotion and disease prevention programs at the worksite: 1993–1995 update. *American Journal of Health Promotion, 10*(5), 380–388.

Pelosi, N. (1996). Reducing risks of mental disorders. *American Psychologist, 51*(11), 1128–1129.

Pentz, M. A. (1992). *Benefits of integrating strategies in different settings. American Medical Association State-of-the-Art Conference on Adolescent Health Promotion Proceedings.* Arlington, VA: National Center for Education in Maternal and Child Health, 15–33.

Ramey, C. T., & Ramey, S. L. (1992). Effective early intervention. *Mental Retardation, 30*(6), 337–345.

Reiss, D., & Price, R. H. (1996). National research agenda for prevention research: The National Institute of Mental Health report. *American Psychologist, 51*(11), 1109–1115.

Rice, D. P., & Miller, L. S. (1998). Health economics and cost implications of anxiety and other mental disorders in the United States. *British Journal of Psychiatry, 173*(Suppl. 34), 4–9.

Rippe, J. M., Price, J. M., Hess, S. A., Kline, G., DeMers, K. A., Damitz, S., Kreidieh, I., & Freedson, P. (1998). Improved psychological well-being, quality of life, and health practices in moderately overweight women participating in a 12-week structured weight loss program. *Obesity Research, 6*(3), 208–218.

Robins, L. N., & Regier, D. A. (1991). *Psychiatric disorders in America: The epidemiologic catchment area study.* New York, NY: The Free Press.

Rogers, P. J., Eaton, E. K., & Bruhn, J. G. (1981). Is health promotion cost effective? *Preventive Medicine, 10*, 324–339.

Rollins, R. (1997). *DMHAS and the managed care of substance abuse prevention services in Connecticut: Analysis of concepts and context.* Bethesda, MD: Pacific Institute for Research and Evaluation.

Rosen, J. C., & Wiens, A. N. (1979). Changes in medical problems and use of medical services following psychological intervention. *American Psychologist, 34*(5), 420–431.

Rosenbaum, S., Silver, K., Wehr, E., & Serrano, R. (1996). *Principal findings from an analysis of contracts between managed care organizations and community mental health and substance abuse treatment and prevention centers.* Washington, DC: George Washington University Center for Health Policy Research.

Roter, D. L., Hall, J. A., Merisca, R., Nordstrom, B., Cretin, D., & Svarstad, B. (1998). Effectiveness of interventions to improve patient compliance. *Medical Care, 36*(8), 1138–1161.

Russell, L. B. (1997). Annotation: The knowledge base for public health strategies. *American Journal of Public Health, 87*(10), 1597–1598.

Russell, L. B. (1987). *Evaluating preventive care: Report on a workshop.* Washington, DC: The Brookings Institution.

Salzman, P. (1998). Prevention: How the prevention field can ready itself for managed care. *SAMHSA Managed Care Tracking Report, 1*(1), 11.

Santiago, J. M. (1993). Commentary: The costs of treating depression. *Journal of Clinical Psychiatry, 54*(11), 425–426.

Satcher, D., Harris, J. R., Gordon, R. L., White, K. E., Stange, P. V., & Harper, S. M. (1995). Prevention and managed care: Opportunities for managed care organizations, purchasers of health care and public health agencies. *Morbidity and Mortality Weekly Report, 44*(No. RR-14), 1–12.

Satcher, D., & Hull, F. L. (1995). The weight of an ounce. *Journal of the American Medical Association, 273*(14), 1149–1150.

Schauffler, H. H., & Rodriguez, T. (1996). Exercising purchasing power for preventive care. *Health Affairs, 15*(1), 73–85.

Schauffler, H. H., & Wilkerson, J. (1997). National health care reform and the 103rd Congress: The activities and influence of public health advocates. *American Journal of Public Health, 897*(7), 1107–1112.

Schneider, R. H., Staggers, F., Alexander, C. N., Sheppard, W., Rainforth, M., Kondwani, K., Smith, S., & King, C. G. (1995). A randomized controlled trial of stress reduction for hypertension in older African Americans. *Hypertension, 26*(5), 820–827.

Shipley, R. H., Orleans, C. T., Wilbur, C. S., Piserchia, M. S., & McFadden, D. W. (1988). Effect of the Johnson & Johnson LIVE FOR LIFE program on employee smoking. *Preventive Medicine, 17*, 25–34.

Shore, M. F., & Beigel, A. (1996). The challenges posed by managed behavioral health care. *The New England Journal of Medicine, 334*(2), 116–118.

Simon, G. E., VonKorff, M., & Barlow, W. (1995). Health care costs of primary care patients with recognized depression. *Archives of General Psychiatry, 52*, 850–856.

Smith, G. R., Rost, K., & Kashner, T. M. (1995). A trial of the effect of a standardized psychiatric consultation on health outcomes and costs in somatizing patients. *Archives of General Psychiatry, 52*, 238–243.

Somers, A. R. (1984). Why not try preventing illness as a way of controlling Medicare costs? *The New England Journal of Medicine, 311*(13), 853–856.

Stoil, M. J., & Hill, G. A. (1998). Critical mandates: Prevention and health promotion. *Behavioral Healthcare Tomorrow,* 19–23.

Stoil, M. J., & Hill, G. A. (1996) *Interaction between managed care and prevention resources: A preliminary analysis of eight models.* McLean, VA: Conwal, Incorporated.

Substance Abuse and Mental Health Services Administration. (1998a). *Health care spending: National expenditures for mental health, alcohol and other drug abuse treatment 1996.* Rockville, MD: Author.

Substance Abuse and Mental Health Services Administration. (1998b). *Managed behavioral healthcare updates: State and local activities in managed behavioral health, 1(1).* Rockville, MD: Author.

Substance Abuse and Mental Health Services Administration. (1997). *Selected findings in prevention: A decade of results from the Center for Substance Abuse Prevention.* Rockville, MD: Author.

Taube, G. (1996). Looking for the evidence in medicine. *Science, 272*, 22–24.

Teutsch, S. M. (1992). A framework for assessing the effectiveness of disease and injury prevention. *Morbidity and Mortality Weekly Report, 41*(No. RR-3), 1–12.

Thompson, R. S., Taplin, S. H., McAfee, T. A., Mandelson, M. T., & Smith, A. E. (1995). Primary and secondary prevention services in clinical practice: Twenty years' experience in development, implementation, and evaluation. *Journal of the American Medical Association, 273*(14), 1130–1135.

Tobler, N. S. (1992). Drug prevention programs can work: Research findings. *Journal of Addictive Diseases, 11*(3), 1–28.

Tobler, N. (1994). Meta-analytical issues for prevention intervention research. *NIDA Research Monograph,* 142, 342–403.

Trickett, E. J., Dahiyal, C., & Selby, P. M. (1994). *Primary prevention in mental health: An annotated bibliography 1983–1991.* Rockville, MD: National Institute of Mental Health.

U.S. Department of Health and Human Services. (1998). *Put prevention into practice: Clinician's handbook of preventive services.* (2nd ed.) Washington, DC: Author.

Vickery, D. M., Golaszewski, T. J., Wright, E. C., & Kalmer, H. (1988). The effect of self-care interventions on the use of medical service within a Medicare population. *Medical Care, 26*(6), 580–588.

Vickery, D. M., Kalmer, H., Lowry, D., Constantine, M., Wright, E., & Loren, W. (1983). Effect of a self-care education program. *Journal of the American Medical Association, 250*(21), 2952–2956.

World Health Organization Brief Intervention Group. (1996). A cross-national trial of brief interventions with heavy drinkers. *American Journal of Public Health, 86*(7), 948–955.

Windsor, R. A., Lowe, J. B., Perkins, L. L., Smith-Yoder, D., Artz, L., Crawford, M., Amburgy, K., & Boyd, N. R. (1993). Health education for pregnant smokers: Its behavioral impact and cost benefit. *American Journal of Public Health, 83*(2), 201–206.

Zapka, J. G., & Mullen, P. D. (1985). Financing health promotion and education programs in HMOs. *Health Care Management Review, 10*(4), 65–67.

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